Lamp Standard – Making Ledged Door – Furniture Repairs

WOODWORKER

VOLUME XLVIII.
NUMBER 606

MAY, 1944

NINEPENCE
Ann. Post Sub., 10/-
U.S.A. $2/50

MAKING A SHED DOOR

CONTENTS :

KITCHEN CLOCK CASE : BEEHIVE
ELECTRIC LIGHT FLOOR STANDARD
MEAT SAFE : SERVICE HATCH
EVERYDAY TOOLS : THE CHISEL : GIMLETS
FURNITURE REPAIRS : STRENGTH IN TIMBER

Incidental Shelving

From time to time shelves in a recess or elsewhere may have to be renewed, or additional ones fitted, and in days when accommodation in houses is restricted it is well to be familiar with the different methods employed.

A RECESS presents few problems as, with a wall at each side, satisfactory bearings at both sides are available.

Recesses.—The diagram at A, Fig. 1, shows the simplest fixture. Stout fillets are screwed or nailed to the wall at each side and the shelves laid across and nailed down. Recesses vary in depth and the width of shelf will be cut accordingly. It may be in one width, or two or more boards may be jointed together. In this latter case, should the length exceed, say, 42 ins., it is advisable to screw a central batten under the boards. Deal of $\frac{7}{8}$ in. thickness will be adequate for the purpose. The supporting fillets may be of the same stuff, from 2 in. to 3 in. wide according to the weight they have to carry. Round off or chamfer the lower front edges.

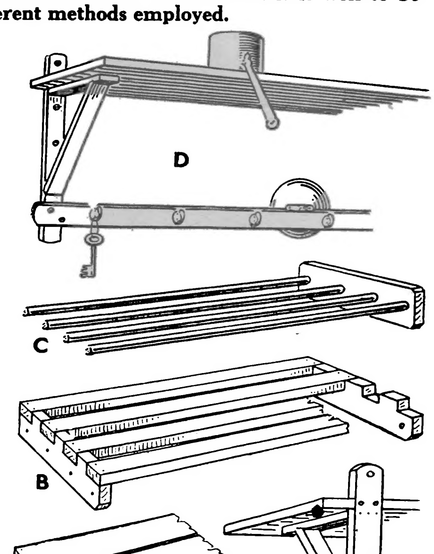
In a kitchen or scullery, or perhaps in a store room or a passage, lath shelving is fitted as at B. This is useful if the width is 12 ins. or over. As a rule the laths are from $1\frac{1}{2}$ ins. to 2 ins. wide, thickness as before being $\frac{7}{8}$in. The space between the laths depends partly on what is to be accommodated, but may vary from $1\frac{1}{4}$ in. to $1\frac{3}{4}$ in. Supporting fillets may be plain (as at A), but they look better if notched to take the laths (B), the notches being cut so that the shelves lie flat. Remember, however, that a notched fillet requires an additional inch in width, say, 3 ins. in all. If, too, the shelving is wide and is likely to carry a considerable weight battens should be screwed underneath.

The rod method at C is sometimes used in the scullery, or for the storage of vegetables or fruit. Dowel rod is used the end fillets being bored through.

Bore both ends together so that the alignment is correct.

Bracketed Shelves (D) are of a different kind. There are many ways of fitting them, one of the neatest and most serviceable being indicated. —The end brackets support the shelf, whilst a rail below provides for pan lids and for a row of hooks. First determine the width of shelf required and then make the brackets. These are shown at E, but if a batten rail is to be added the bracket back must be cut a few inches larger.

For kitchen or scullery shelves, if in deal, the thickness should be $\frac{7}{8}$ in. this applying to the brackets as well as to the shelf. The width of bracket parts may be $2\frac{1}{2}$ in. (or 3 ins. for shelves over 11 ins. wide), the angle brace being notched in top and bottom as indicated at E. The parts are screwed together from behind, the shelf later being notched to fit around the bracket back, and be screwed.



A, B, AND C ARE FIXTURES SUITABLE FOR A RECESS. D AND E CAN FIT ANYWHERE.

WOODWORKER
VOL. 48 MAY 1944 No. 606

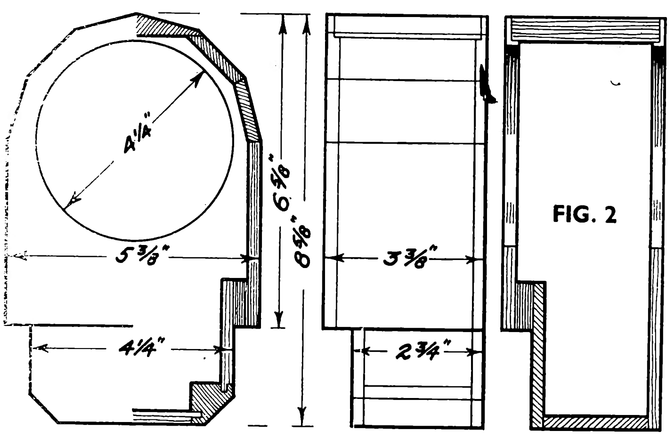
Kitchen Clock Case

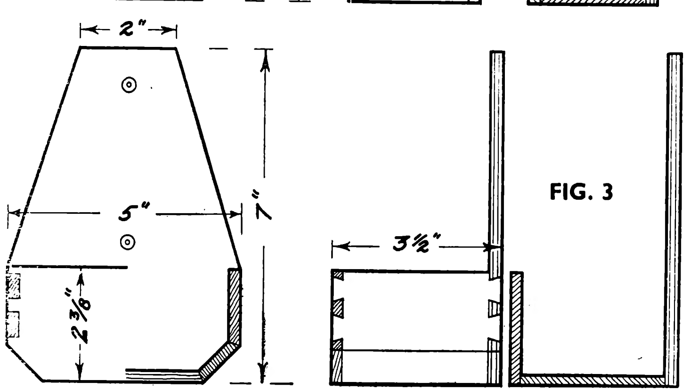
MADE FROM AN OLD FRENCH MOVEMENT

This case was designed specially to hold a clock movement taken from an old marble case of the kind popular in the late Victorian period. It has a painted finish so that practically any oddments of wood can be used for it.

IT is generally more convenient to hang a kitchen clock case on the wall than place it on a mantelshelf, and this was something of a complication in using the existing movement since, although wound from the front, it requires adjustment from the back. Furthermore, being of the pendulum type, it is necessary to rock the clock to start it. At the same time it must be fixed rigidly, otherwise the pendulum is out of beat. This means that, although the clock must be free to be lifted from the wall, it must be rigid when in position. The problem in the present case was solved by making it in two parts. The case proper, and a bracket into which it drops. Thus the bracket can be fixed rigidly to the wall, whilst the clock itself can be lifted out if any adjustment is necessary to the pendulum.

Clock Case.—Details of this are given in Fig. 2 from which it will be





ELEVATION OF CLOCK CASE IS SHOWN IN FIG. 2, WHILST DETAILS OF THE BRACKET ARE GIVEN IN FIG. 3

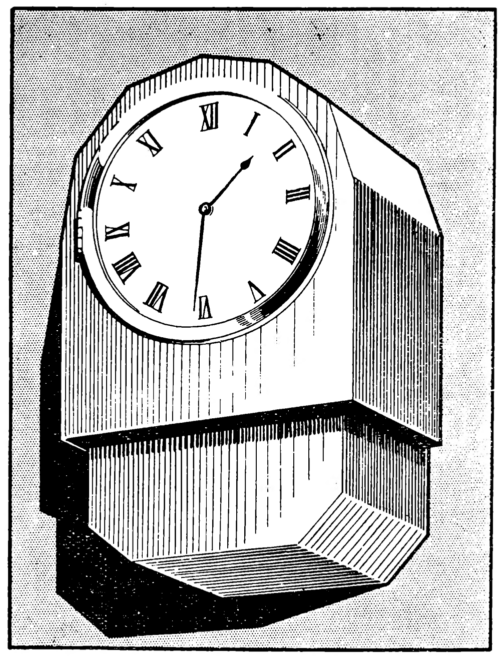


FIG. 1. ATTRACTIVE PAINTED CLOCK CASE. This is made in two parts, the case proper and the bracket. The latter is fixed to the wall, the case resting in it loosely so that it is free to be lifted out.

seen that it is in $\frac{1}{4}$ in. stuff throughout with the exception of the bottom corners which are $\frac{7}{8}$ in. square. The stages in making the case are given in Fig. 4. First the two corners are prepared in one length, the edges being grooved to take the sides and bottom. A shows the first assembling stage. It is obviously important that the sides are parallel and square and to ensure this it is advisable to place a square piece of wood between sides when gluing up.

The front is glued to this as shown at B; the front edges being levelled first. To obtain the necessary thicknessing pieces 1 in. wide by $\frac{5}{16}$ in. thick are glued around the top edges as at B. Level these and glue on the main sides as at C.

The front and back follow. The front finishes level with the ends and naturally has the same projection as the last named. The back, however, extends right down to the extreme bottom of the case. Prepare it in rectangular form, slightly full. Mark the centre and draw in the circle which forms the dial opening. Using the same centre draw in a semi-circle above it and, stepping out with dividers, mark in the flat sides or facets. Before cutting out the circle, work a rebate at the top in which the top can fit.

Assembling can now begin as at D. Glue on the front and back, if necessary positioning them with fine pins. Also add the top. When the glue has set

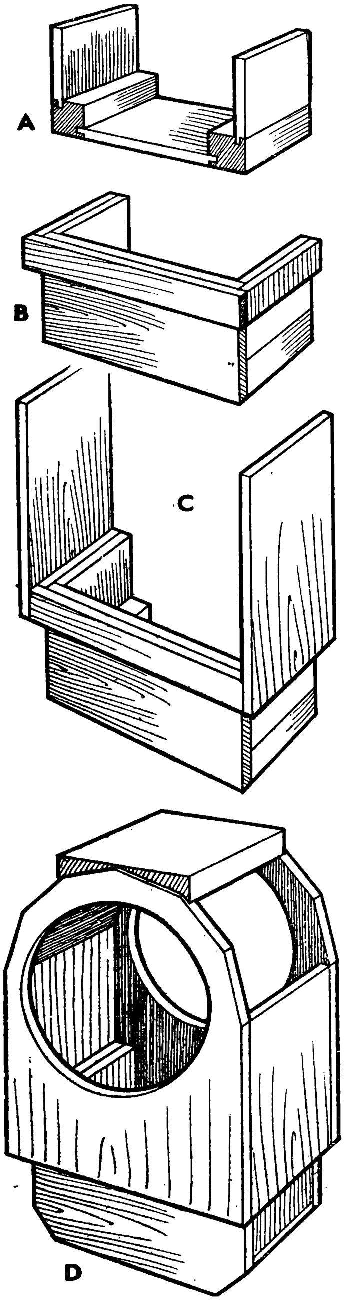


FIG. 4 FOUR STAGES IN MAKING THE CLOCK CASE

the remaining small facets can be added. They are merely butted between the front and back and are bevelled at the long edges in accordance with the angle needed. This is shown clearly in the section in Fig. 2 which shows the approximate angles. Glue them and level down when dry. A few fine nails can be driven in after the glue has set as an additional precaution. Finally the bottom corners can be bevelled off.

Bracket.—This is shown in elevation in Fig 3 and in construction in Fig. 5. The sides are dovetailed to the front and back. If you can arrange for the back to be in plywood so much the better, as this makes a stronger joint. Note that the lower edges of the sides are planed at a slight angle, see from section in Fig. 3. After gluing together add the bottom and the two canted corners. Holes must be bored through the back to take the fixing screws.

You can finish this case with oil paints or with enamel. Yet another alternative is to use poster water colours (2 coats) followed by clear varnish.

These movements are usually held in position by nuts which pass through arms attached to the dial. Thus when the bracket is fixed in position on the wall and the case placed thereon, it is always possible to turn the entire dial and movement one way or the other to get the pendulum into perfect beat. When this had been obtained the fixing screws are finally tightened.

(267)

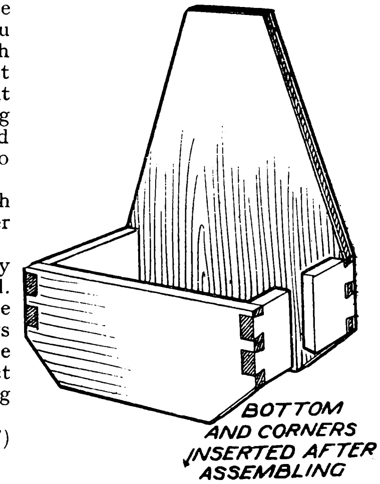


FIG. 5. BRACKET CONSTRUCTION

CUTTING LIST

Clock Case—	Long ins.	Wide ins.	Thick ins.
1 Front	7	5½	¼
1 Back	9	5½	¼
2 Sides	4¼	3	¼
1 Top	3⅜	3¼	½
4 Facets	3	1⅝	¼
2 Corners	2½	⅞	square finished
1 Lower front	4½	3¼	¼
2 Lower sides	2½	2½	¼
1 Thicknessing	5	1⅛	5/16
2 Ditto	1⅛	3	5/16
Bracket—			
1 Back	7¼	5⅛	¼
1 Front	5¼	2½	¼
2 Sides	3¾	1¾	¼
1 Bottom	3¾	3¼	¼
2 Corners	3¼	1¼	¼

CHIPS FROM THE CHISEL

(Continued from opposite page)

this report are full of attractive possibilities.

• • •

Standardisation in furniture is another feature that is envisaged as being necessary for some years to come to meet the post-war shortage. It is suggested that in the immediate post-war period local authorities could do a great deal to ease the problem of the supply of movable furniture by providing built-in fitments such as wardrobes, cabinets, hanging cupboards, and kitchen equipment, manufactured to standard sizes. As regards movable furniture it is recommended that the Utility Furniture Scheme be maintained for some time to come to ensure the production of good quality furniture at reasonable cost, with the proviso that, if possible, the range of variety of design should be extended. Here, at least, the home woodworker will come into his own. Once let him be able to get the timber and he can make his designs as individual as he pleases. This power of choice, and the sense of independence it brings with it, is the old and perennial privilege of the true craftsman, especially precious in a time of "standardisation," for neither he nor the work of his hands can be moulded to a pattern.

(280)

A design for a lean-to greenhouse is in preparation for next month. Sizes are 10ft. to 17ft. long by 8ft wide.

WHY "FIRMER" CHISELS ?

There are probably many terms which have come to be attached to tools which seem to have no particular meaning and apparently no connection with their subject. For instance, why "firmer" chisels? The fact is that many tools go back a long way. A writer on woodworking subjects in the late 17th century speaks of "former" chisels and says that they are so called because they are used before the paring chisel. It thus appears that the term "firmer" is a corruption.

The same writer also mentions that most saws (so far as London was concerned) were sold by ironmongers in Foster Lane. It appears, too, that taperground saws are no modern idea, since he says that the back edge should be thinner than the tooth edge. Saws were also set since instructions on the process appear in the book.

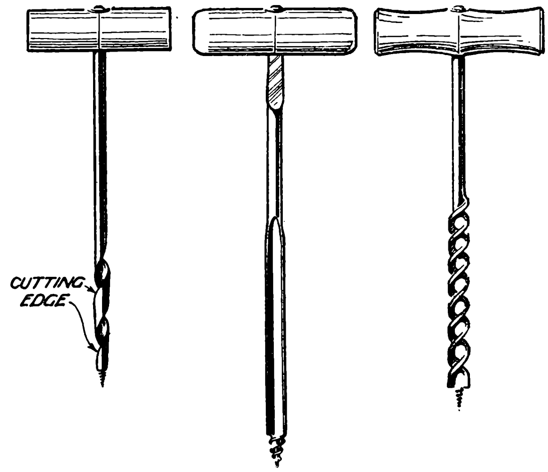
Speaking of "plains" the advice is tendered that for softwood the iron should be set to give a shaving as thick as an old shilling. For hard stuff it should be as thick as an old groat.

Some men invariably adopt a circular movement when sharpening a plane iron or chisel. For their benefit a special circular oilstone is made, this enabling a wide sweep to be made. In most cases they are the combination type, fine one side and coarse the other.

Never use linseed oil on an oilstone. It dries hard and soon chokes the pores, making the stone useless.

About Gimlets

Gimlets do not seem to have the popularity they enjoyed some years back. Nowadays when a fairly large screw hole is needed the worker generally takes his brace and bit; for small ones he uses the bradawl. Still, the gimlet is handy on occasion, and here we deal with the various kinds and their uses.



TYPES OF GIMLETS IN GENERAL USE.
Half-twist. Shell. Auger.

THE chief use of a gimlet is in making screw holes. It is threaded at the end so that as it is revolved it eats its way into the wood, so obviating the need for downward pressure. In this respect it differs from the bradawl. Furthermore there is a positive cut, the core or waste escaping along the spiral or groove. With the bradawl there is no core, the edge cutting the fibres and the wedge shape of the bevels forcing them apart.

It will be realized then that the gimlet is specially suitable for tough wood which would offer considerable resistance to the bradawl. It is also invaluable in positions where it would be awkward to apply the pressure that the bradawl needs. For instance if you had to bore a hole high up and were standing on the top of a ladder it would be most awkward to exert any pressure with your arm extended. After the initial press-in, the gimlet needs only to be turned.

One failing is its liability to split the grain if used near an edge. Some kinds are worse than others in this respect, but the safe rule is to avoid working near an edge, especially if the wood is thin and of a soft or brittle nature. It is not very satisfactory on end grain—for the same reason that a screw does not hold well in end grain. The fibres into which the thread cuts its way are necessarily short in the grain and readily crumble. Thus, although it ***can*** be used for end grain, a certain amount of pressure is essential.

Kinds of Gimlets.—The most commonly used type is what is termed the half-twist gimlet. It is similar in shape to the bit of that name. It is shown here, and it will be seen that there is a screw end which bites into the wood and so feeds the tool along. Above is a spiral groove, the flat metal part between being of tapered form. Thus as the gimlet is turned the top edge of the flat part, projecting more than the lower part, cuts the wood. The core escapes along the spiral groove.

A second type is known as the shell gimlet. This has the thread at the end, but in place of the spiral groove there is a straight one. In this all the cutting takes place at the end just above the thread, the straight groove serving only as a clearance passage. Of course, the main stem, in bearing against the sides of the hole keeps the tool running straight.

The two types given above run from very small sizes up to about $\frac{1}{4}$ in. For larger holes up to $\frac{1}{2}$ in. the auger gimlet is needed. This is rather like the twist bit, but there are no nickers; only the cutters. Consequently the hole it makes is inclined to be rather rough since there is no preliminary cutting of the grain. However there are many rough carpentry jobs for which it is suitable.

Bell hangers' or electricians' gimlets are of the twist or shell type but are very much longer, ranging up from 12 in. up to as much as 36 in.

It is not always realized that gimlets need sharpening. For the main spiral of the half-twist type use a fine rat-tail file, following the general direction of the twist. Note that it is the top edge of the flat part which cuts; it is therefore the lower side of the groove which needs rubbing. If the thread is dull it can be revived with a small three-cornered file. The latter also applies to the shell gimlet, but the cutting edge of the groove also needs rubbing up, especially towards the bottom. You can tell which edge cuts by revolving the gimlet in the usual clockwise direction. The cutters of auger gimlets should be rubbed on the upper side only with a flat file having a safe edge. (278)

Chips from the Chisel

A REPORT on *Planning our New Homes,* just issued by the Scottish Housing Committee, is well worth careful study. It represents a real attempt to come to grips with post-war housing problems and a real attempt to plan on lines that will be acceptable to the men and women who will inhabit the post-war houses. Questionnaires have been sent round to men and women in the Forces and in industry in order to get their opinion on various types of houses and equipment, and the results show a striking degree of unanimity. The vote is quite definitely in favour of the "cottage," synonymous in the report with the small detached or semi-detached house in its own garden as opposed to the flat, and anything in the way of communal arrangements for laundry, drying clothes, etc., has nowhere received a favourable vote. The Englishman—and woman—remains the sturdy individualist who desires privacy in his own life, in spite of the experience, now being acquired in all directions, of community life—probably all the more because of it.

—"This power of choice and the sense of independence it brings with it is the old and perennial privilege of the true craftsman."

One thing that is stressed is the part which standardisation must inevitably play in the provision of post-war housing, if the needs of men and women returning to civilian life are to be adequately met. The question of prefabricated houses is glanced at. It is evident, in spite of the assumption constantly met with in the daily press that prefabricated houses are well on the way, that the whole matter is so far in an experimental stage. The report refers to the possibility of prefabricated plumbing units and kitchen and bathroom units; also to the possibility of the machine manufacture of the principal structural elements in the house, but states that the whole question is at present being investigated by an Inter-Departmental Committee on House Construction. One thing, however, it is encouraging to note the Housing Committee has firmly in mind, and that is the necessity of variety in design and lay-out. Gone is the time when it is taken for granted that streets of drab-looking terrace houses are good enough for the workers. The public conscience has been aroused, tardily enough, to the ugliness and drabness of our industrial towns and cities, and here at least is a committee anxious to avoid the mistakes of the past and to plan for a better future. The danger is that barrack-like blocks of flats will be the modern substitute for drab terraces, but to see the danger is to know how to take steps to avoid it, and designs and lay-outs

(*Continued on opposite page*).

• • • LIGHTING THE HOME • • •

Floor Standards

Floor standards are perhaps the most generally useful of all lighting fittings; they can be employed either to give a direct light for reading or working, or, with the fitting shown in Type "B," a general light over the whole room by reflection from the ceiling. This combined "direct-indirect" fitting consists of a metal bowl reflector with one lamp inside and two outside, with a two-way switch to give light up or down, or both, as required.

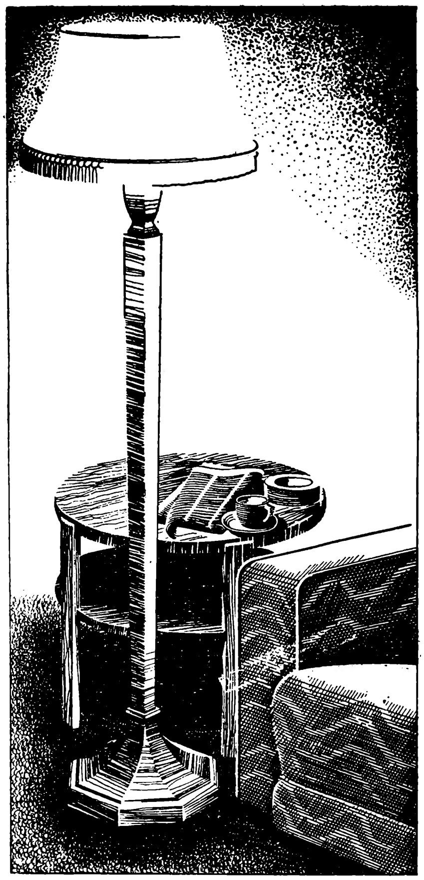


FIG. I. IDEAL IN THE LIVING ROOM. A choice of two designs is given. That shown above is type A. No boring is necessary as the shaft is made of two grooved pieces.

TYPE "A" is designed for walnut or mahogany with a polished finish, the shaft and base being cross-banded with straight grained veneer. As the veneer covers the whole surface the groundwork could be in any hardwood to hand, the only parts for which solid walnut or mahogany will be needed being the skirting and the neck moulding. "B" is a simpler model in solid oak or chestnut, waxed or weathered. The direct-indirect fitting could equally well be used for "A," providing a wide shade is used so that the light can spread at the top.

TYPE (A)

The Shaft.—This is made up of two pieces $1\frac{1}{2}$ in. thick by 4 ft. $4\frac{3}{4}$ in. long (allowing a 3 in. tenon at the bottom) and tapered from 3 in. to $1\frac{1}{2}$ in. in width, this being left oversize at this stage. To economise, both pieces could be cut from a 5 in. board, marking one top width and one bottom width at each end and cutting at an angle. One piece has a $\frac{3}{8}$ in. by $\frac{3}{8}$ in. groove down the centre, worked with a plough or deep gouge, with a piece of string laid in so that the flex can be pulled through after assembly. The two pieces are glued together, excess glue being squeezed out by rubbing, and cramped up.

When the glue is hard, square the ends and set out the section on them, planing down to the marks to give an equal taper on each face. Use a bevel set to the angle for squaring across the members for the vase shape at the top and also the shoulders of the tenon and $\frac{3}{8}$ in. by $\frac{1}{8}$ in. rebate for the neck moulding above. Make a templet of the vase profile and use this for marking the shape on back and front of the shaft Work to these lines with a chisel, finishing the curves with a rasp, and repeat on the other two faces, using the template to check for veneering.

Starting with the straight taper, veneer back and front first, trim the edges flush, and then veneer the other two sides. The shaped top is similarly treated. The veneering of this will be greatly simplified by making two softwood cauls to fit the profile and cramping these on with handscrews until the glue is hard, as shown in the enlarged detail, paper being placed between caul and veneer to prevent sticking.

The Base.—With dry timber this may safely be made in the solid, the thickness being made up with two 3 in. blocks to avoid undue waste in the shaping. If 3 in. stuff is not obtainable, other thicknesses could be used, the size of the upper blocks being determined by measurement from the profile drawn out full size. Starting with the lower block, set out the octagon and cut to shape, planing the edges square, forming the rebate for the skirting and gauging a line for the flat above. The upper block is similarly cut to shape and the mortise to take the shaft cut. It is centred on the lower block and fixed with glue and screws, care being taken to keep the screws well inside the profile, and a hole for the flex bored through.

Start the shaping on one face and work right through from front to back with a gouge, finishing with a round plane. Repeat on the opposite face and then on back and front. The four intermediate faces are worked last, the angles being slightly flattened so that the veneer will not run out to a feather edge. Tooth all over with a tenon saw and veneer, preferably with cauls as for the top, the pressure being applied radially to the curve as far as possible. If a bench holdfast is available fix the base temporarily to the bench and apply pressure to the centre of the caul with this. A block shaped to the curve is useful for taking the glasspaper when cleaning up.

Assembly.—First fit the shaft dry and sight against a plum-line to ensure its being vertical to the base. Make a saw-cut in the bottom of the tenon to take a wedge, the sides of the mortise being slightly splayed out so that as the tenon enters the wedge spreads it and holds it firmly (foxtail wedging). Remember to bring the string for the flex out through the base before gluing. The neck moulding and skirting may now be glued into place, the latter being strengthened by glued blocks behind. Stability will be improved by a weight, as heavy as possible, screwed under the base as shown by the cross-hatching in the section, and the base is completed by wooden toes or "Domes of Silence."

After cleaning up and polishing, tie the flex firmly to the string and pull through, connecting up with a flat-base lampholder, with switch, screwed to the top. The shade chosen should be of such a depth that, when in position on the carrier, the lower edge comes about an inch below the top of the shaft. An attractive and simpler alternative with this design would be to cut out the veneering and finish in paint with a "crackled" or fine stippled surface.

TYPE "B"

The Shaft.—This is made in halves as for the first type, planed down to finished thickness of $\frac{7}{8}$ in., with the width left full. After jointing, set out the hexagon on each end and mark the two parallel faces with pencil as a guide in planing down to section. The type of fitting shown is usually supplied with a metal bush which should be sunk flush in the top, the bottom of the shaft being formed into a tenon. The ornament is marked out in pencil as shown in the detail and cut with a flattish gouge, the top and bottom cuts being made first to prevent splitting and the shape completed by a cut made from each side.

The Base.—Set out the hexagon on a piece of wood planed to $1\frac{3}{4}$ in. thick, cut the angles and plane the edges square. The line of the bottom flat is now marked with the gauge, using pencil instead of the point, and the boundary of the top chamfer marked in the same way. Next, plane the bevels to section and cut the mortise for the shaft; this is eased away slightly on two sides to permit wedges to be inserted when gluing up. For this type it would be better to have two separate weights sunk on either side of the mortise, as a central weight would involve shortening the tenon.

RODNEY HOOPER

(*Cutting List appears on page* 87)

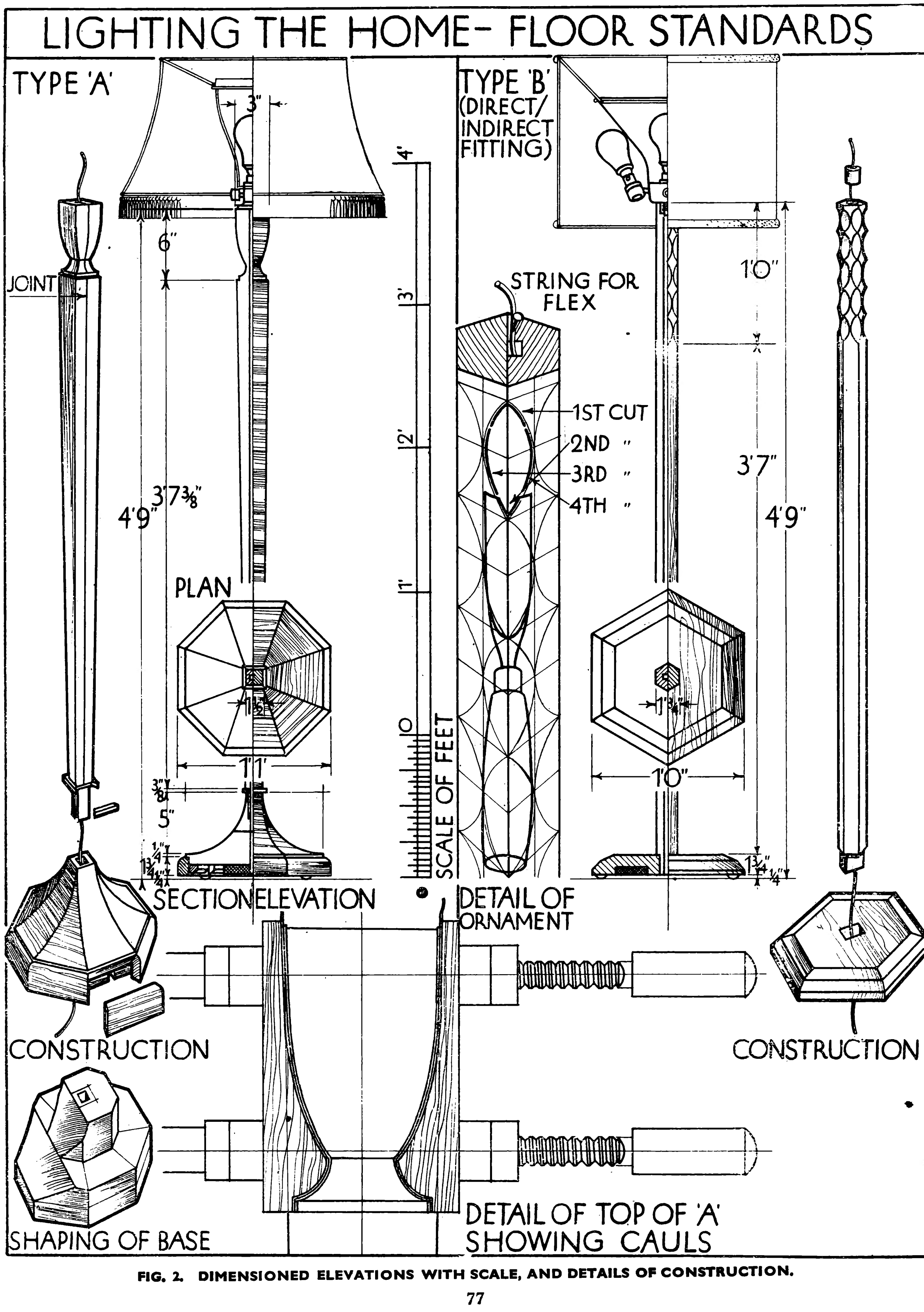


FIG. 2. DIMENSIONED ELEVATIONS WITH SCALE, AND DETAILS OF CONSTRUCTION.

EMERGENCY FOOD SAFE

Indoor food safes for meat and vegetables are at present in demand. There is little that we can afford to let waste, but the problem is to scheme a light and inexpensive cabinet which can be made at home from material available. Bearing in mind the limited accommodation that the average householder has, we may suggest a safe on the simple lines shown.

THE height of 4 ft. allows for a meat compartment 21 ins. (or more) high. Below this there is room for three drawers or trays for vegetables and other items. A front-to-back depth of 18 ins. is ample, and the width may be from 20 ins. to 24 ins. as required.

The ends, as will be seen, are framed, which means that no wide boards are wanted. Instead of solid shelves (G) laths of 2 ins. or 3 ins. wide may be used. The top (H) will be jointed to width, and drawer sides and battens could be in laths if found more economical. Softwood may be used throughout, the piece being left in the white.

Carcase.—Dealing first with the two framed ends, the strongest construction is to tenon the three rails (B) to the stiles (A). In a less pretentious way the joints may be halving ones as shown (Fig. 2). Before screwing, however, tongue in the drawer guides (D) to which the runners (C) are screwed from below. Note that the runners are cut to fit around stiles, and that at front they are sawn short to allow for the thickness of drawer front. Test both ends for squareness and see that both are exactly alike.

In assembling, it will be seen that the ends are connected by the three top rails (E), two back rails (F) and a front bottom rail (F), all these rails being lap-dovetailed. Further stiffening is secured when the bottoms (G) are screwed down. These bottoms (or shelves) may be solid, jointed to width ; but, if economy in timber can be secured, they may quite well be of 3 ins. or 4 ins. laths, screwed down with spaces of ½ in. or ¾ in. between. The top (H) is screwed through rails (E). It will be jointed to width, or tongued and grooved boards can be used.

Back.—The entire back (J) may be boarded right over, or, instead, laths of about 2 in. by ⅜ in. may be spaced ½ in. apart and nailed on. Another plan is to cover the upper back with perforated zinc and either board in or lath the lower half. The sides of meat safe section will be lined with perforated zinc, this being fitted inside.

Door is framed and hung to right hand stile with 2½ in. brass butts. Halved or bridle joints will serve. Line the inside with perforated zinc.

Drawers (for vegetables, etc.) are fitted as trays, sliding on the runners (C). As there are no bearer rails between, the fronts of the two bottom drawers stand about ⅞ in. above the sides and butt on the runners when closed. The top drawer is made in the ordinary way. Sides (⅝ in.) are lap-dovetailed to fronts and through-dovetailed to back (½ in.). Bottom may be of plywood or of ⅜ in. laths spaced ½ in. apart. (270)

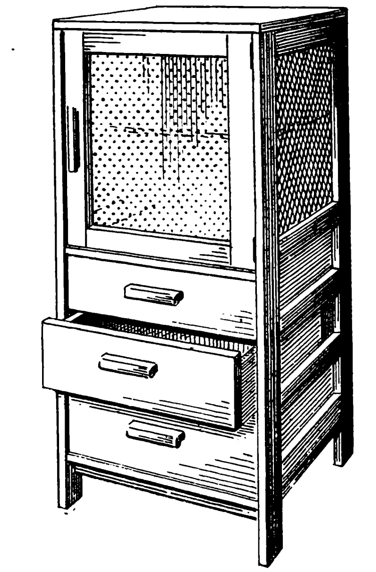


FIG. 1. LIGHT FOOD SAFE. 4 ft. high by 20 ins. by 18 ins. Provision is made for a meat compartment 21 ins. high and three drawers for vegetables, etc.

CUTTING LIST

		Long ft.	Long ins.	Wide ins.	Thick ins.
(A)	4 Stiles	4	0	2¼	⅞
(B)	6 End rails	1	6	2¼	⅞
(C)	4 Runners	1	6	2	⅞
(D)	4 Guides	1	3	1¼	⅞
(E)	2 Top rails	1	8	3	⅞
	1 Ditto	1	8	2	⅞
(F)	3 Cross rails	1	8	2¼	⅞
(G)	2 Bottoms	1	8	18	⅞
(H)	Top	1	8	18	⅞ or ¾
(J)	(See letterpress)				
(K)	Inside shelf	1	7½	17	½
	2 Door stiles	1	9½	2¼	⅞ or ¾
	2 Door rails	1	6½	2¼	⅞ or ¾
	1 Drawer front	1	6½	5½	⅞
	1 Ditto	1	6½	6½	⅞
	1 Ditto	1	6½	7½	⅞

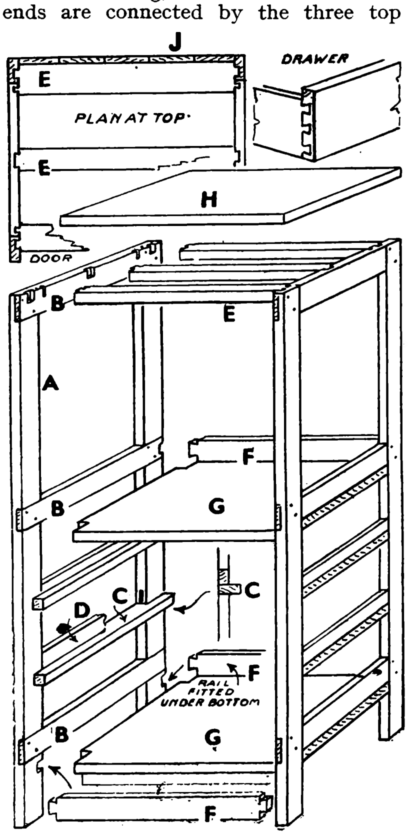


FIG. 2. CARCASE CONSTRUCTION.

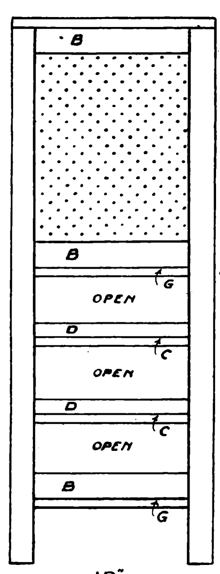


FIG. 3. END VIEW.

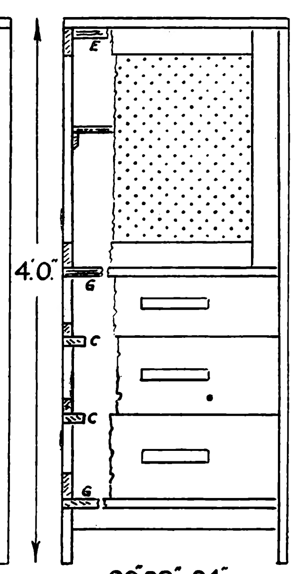


FIG. 4. FRONT ELEVATION.

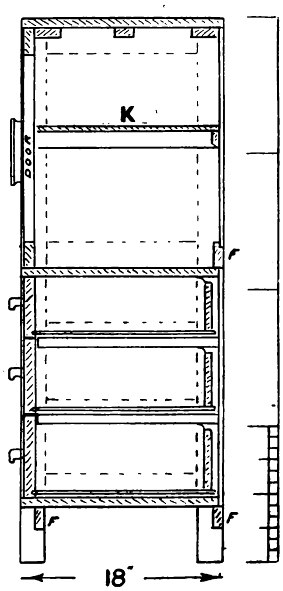


FIG. 5. SECTION.

Everyday Tools

Chisels

It is probably no exaggeration to say that the chisel is used more than any other tool on the bench. Think for a minute of the countless uses to which it is put during any one day at the bench, from marking out work, chopping joints of every kind, fine paring work, taking off odd corners, and so on. Here we deal with the common bench chisel.

DO you ever come across that rather pathetic relic, the chisel from the household tool box? You know what I mean; the kind which has never been sharpened since it came into the house, and which has been used as a screwdriver, scraper, or lever, and for every purpose except the one for which it was intended, and whose handle has been splintered and broken by smashing with the hammer. I don't suggest that your chisels ever reach that state; I merely point out the fact that tools are often used for unusual purposes, and that even the professional sometimes finds the chisel handy to scrape the glue from a joint, or prise up a batten.

Faults.—Taking first the handle, Fig. 1, E shows the result of continual hard hitting with the hammer. The fibres become bent over and parts split off, and the result is that the tool becomes of little value. The force of a blow becomes largely absorbed by the cushioning effect of the bent fibres, and you can't use it for paring because it is uncomfortable to grip. Not that an occasional tap with the hammer does any great harm, but that as a general rule it is much better to use the mallet.

A New Handle.—A new handle is easily fitted. Select one of a size that gives balance. Too large a handle means that you will unconsciously exert more pressure than the tool will bear, whilst a small one fitted to a wide blade will result in poor control and inadequate power.

You will probably find that the tang is too tight a fit in the hole and the latter will need easing. If you have a half-twist bit of about the right size you can use this because it is tapered in general form as shown at B, and so agrees with the taper of the tang. Otherwise you will have to ease the hole with drills of two or three sizes as at C. In this way the "steps" will approximate to the taper and will give to the shape when knocked in. In any case allow the tang to enter until the shoulder is ¼ in. or so from the ferrule (allow rather more for large chisels). Then, placing the blade in the vice so that shoulder bears on the jaws, knock home with the mallet as shown at D.

Sometimes a handle becomes loose, a fatal fault. It means that you have no control, and it is most annoying for the handle to pull off when being withdrawn from a tight joint. Little tapered slips of wood can be used to tighten the fit, but remember to put a dab of glue on them before finally driving home. It is also necessary to arrange the slips so that the blade is in alignment with the handle. If out of truth faulty cutting may result, and much power is lost if struck with the mallet. Furthermore the latter only results in the bend becoming worse. As a rule slips on opposite sides of the tang put things right.

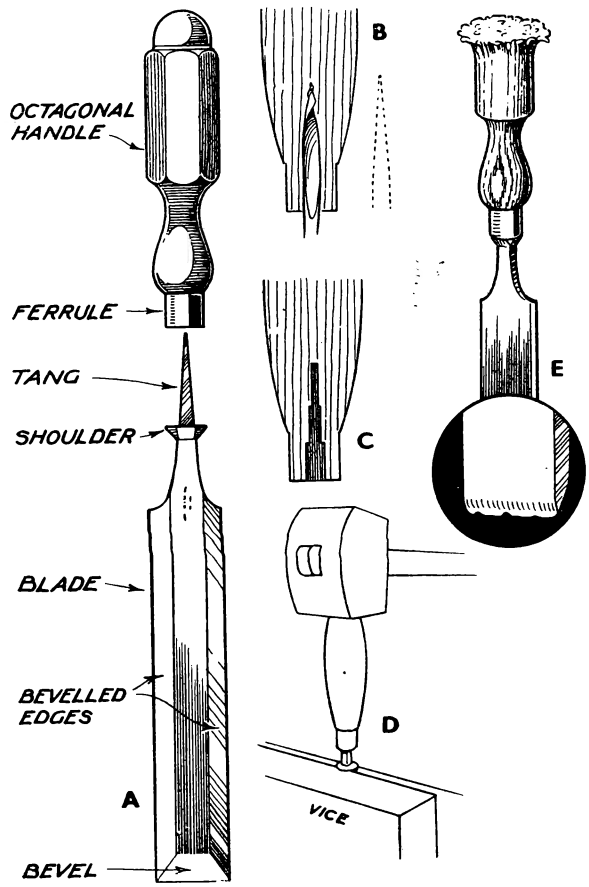


FIG. 1. DETAILS OF THE BEVELLED-EDGE CHISEL.
A. Parts of the chisel. B. Half-twist bit used for fitting tang. C. Three sizes of drill used. D. Knocking on the handle. E. Deplorable state of the "household" chisel.

A bent tang (this generally occurs in the smaller sizes) may be the cause of bad alignment. The only plan is to remove the handle, place the tang on a piece of metal and straighten with the hammer.

The Blade.—Reverting to our household chisel at E, Fig. 1, it is clear that the edge is in a bad way. No doubt it has been used for lifting tacks and other doubtful jobs, but the really serious fault is that the back has been dubbed over—probably on the curbstone. One can imagine what has happened. Instead of bothering to rub down the bevel, someone has taken the path of least resistance and has tried to get an edge quickly by dubbing over the back.

The result is that it is impossible to use it for paring a flat surface because the cutting edge does not touch the wood (see A, Fig 2), and it is equally useless for accurate chopping because it drifts from the vertical as shown at B. There is only one thing to be done, regardless of whether the edge is gashed or not; it must be reground. Ask the grinder to take it back to the extent of the dubbing over. Incidentally it is an excellent plan to have the corners of your firmer chisels ground off as at C. It enables you to work close into awkward corners.

Most men sharpen a chisel at about 30 degrees (the usual grinding angle is from 20 to 25 degrees). Theoretically a chisel used for softwood will stand a lower angle than one for hardwoods; the same thing applies to a paring chisel as compared with one to do heavy chopping.

(*Continued on page 81*)

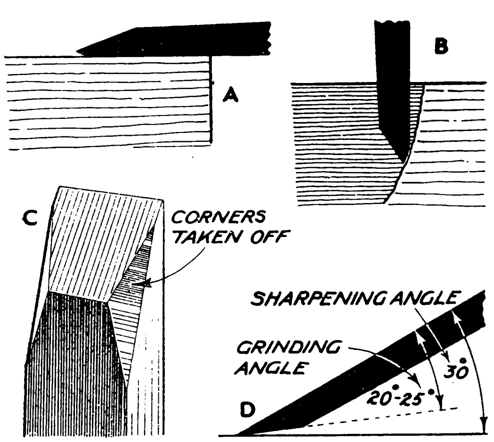


FIG. 2. SHARPENING AND GRINDING DETAILS.
A and B. Back dubbed over. C. Useful grinding note. D. Angles for bevel.

Modern Dou

A Simpler and Cheaper Type of

Before commencing to make a beehive
keeping as possible from the many excell
should the reader have had no previous
another person. The beehive shown her
thing must be absolutely square and clo
accuracy do not tolerate gaps and empt
with comb, anything under with propoli
is essential, and a hive must be constru
temperature throughout the year. Bees
be preferred in our unstable climate.
A slightly raised concrete platform wou
soil, a spirit level should be used to test
will b

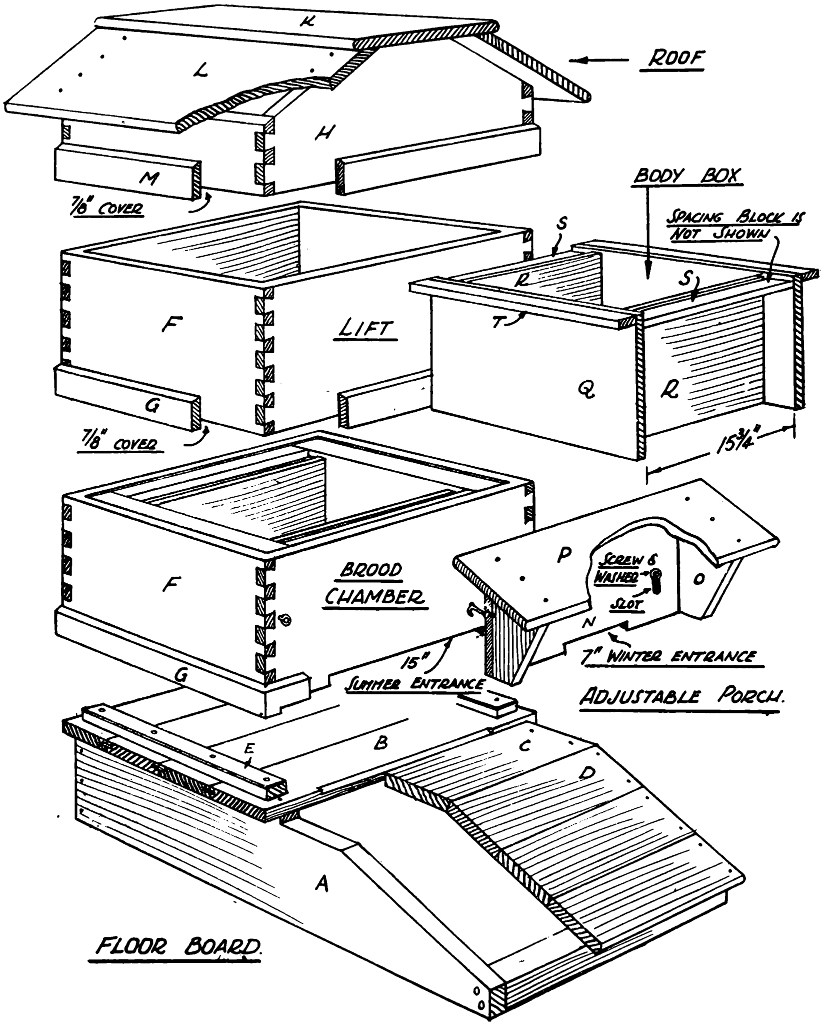


FIG. 2. THE COMPONENT PARTS AND HOW THEY ARE ASSEMBLED.

THE modern beehive consists of four or more separate sections (Fig. 2) : floorboard, brood chamber, lift or lifts, and roof. The hive is tiered and there is no limit beyond stability to what height it may be built. Any number of lifts or " supers " may be added according to the strength of the stock. Between the brood chamber where the queen lays her eggs and the super is fitted a queen excluder which allows the working bees to pass but not the queen, owing to her size. This is a slotted zinc plate or galvanised grill.

Special points about the hive shown on this page are the detachable and adjustable porch, omitting the entrance closers, and the filling in of the spaces between the body boxes and outer case so that no current of air passes which tends to make the hive cold in winter. Also, as the outer case is square, the inner boxes can be placed either way, comb frames running front to rear as is usual or alternatively from side to side. Some experts think the latter method preferable being warmer in winter. The entrance slot must be cut in the bottom brood chamber to suit whichever method of frame layout is adopted.

Construction.—The walls of the roof, lift or lifts, and the brood chamber (F and H) should be through dovetailed together. Paint or waterproof glue should be used when assembling. Western red cedar is the best wood as it is rot proof, but good well-seasoned deal would be excellent if painted as all beehives should be. Each box should be square, equal in lateral dimensions, and the edges of each should meet perfectly with a good close joint. The slopes required for the roof boards should be sawn and planed after assembly. The roof (K-L) should have ample overhang to carry off rainwater and is nailed or screwed on.

The Floor Board (Fig. 2) is nailed or screwed to stout battens (A) which are notched and tapered for the alighting board. The boards forming the floor should be at least $\frac{7}{8}$ in. thick and the joints tongued. Two blocks (E) are screwed $\frac{7}{8}$ in. in from the ends at each side, positioning the brood chamber and forming additional security against draughts and water entering.

The plinths to roof, lift, and brood chamber (G-M) are $2\frac{1}{2}$ ins. by $\frac{5}{8}$ in. thick bevelled off along the top edge and mitred at the corners. Each plinth is carried down $\frac{7}{8}$ in. below the bottom edge of its respective case forming a weather covering to the joint. The front plinth to the brood chamber stops each side of the porch and is notched to fit over the alighting board which is slightly stepped down to prevent any possibility of water entering the hive (Fig. 3). All are screwed on.

The Body Boxes that fit inside lift

and brood
that the lo
the front
entrance l
case. T
entrance
case must
section).

The sid
full length
(R) (Fig.
$15\frac{3}{4}$ ins. i
standard

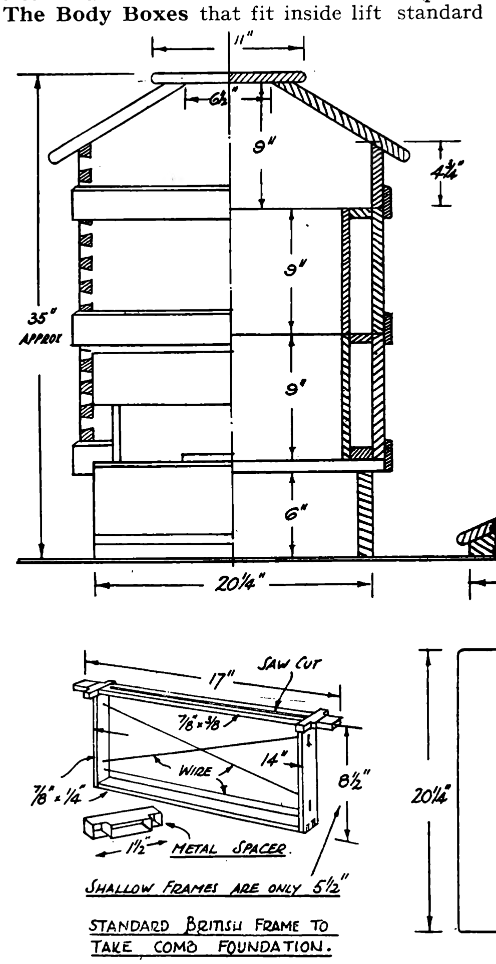


FIG. 3. SECTIONAL FRONT AND SIDE ELE

ıble-walled Beehive

Beehive appeared in the August, 1943 " Woodworker."

it is advisable to obtain as much information about bees and bee-
ent books on Apiculture, and if possible, from practical beekeepers,
experience. This applies whether he makes the hive for himself or
should prove satisfactory if properly and carefully made. Every-
e fitting. Bees who make their comb cells with such mathematical
y spaces. Any space much over a quarter of an inch may be filled
, a sticky substance known as bee glue. Water and weather tightness
cted in such a manner that ensures as far as possible an equable
are very susceptible to cold, hence a double walled hive is much to
astly, when siting a hive, great care must be taken to set it level.
d be best. If bricks are used to keep the floor board base above the
the floor board. Bees build their cells vertically and much trouble
caused if this precaution is neglected.

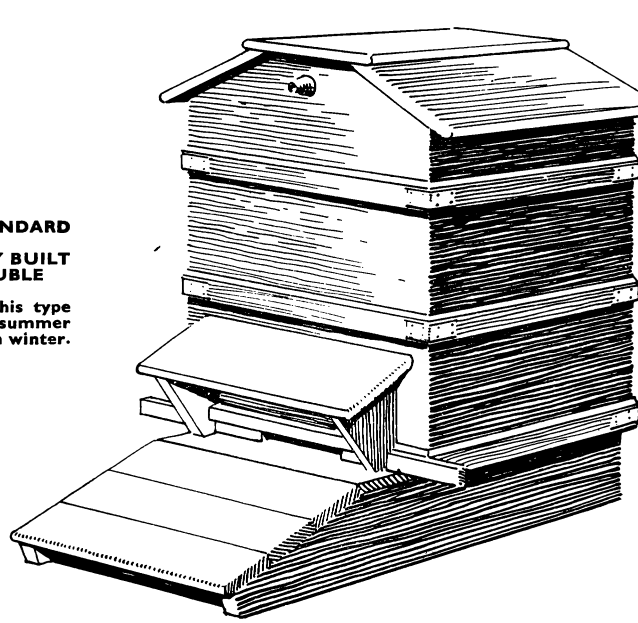


FIG. I. STANDARD BEEHIVE, STRONGLY BUILT WITH DOUBLE WALLS.
A house of this type is cool in summer yet warm in winter.

chamber are similar excepting
er one will be cut away along
bottom edge to form an
neable with that in the outer
ne empty space above the
between the inner and outer
be well blocked in (Fig. 2, end

es (Q) of each body box are
inside but the front and back
2) have a sight length of
n order to accommodate ten
comb frames and should be

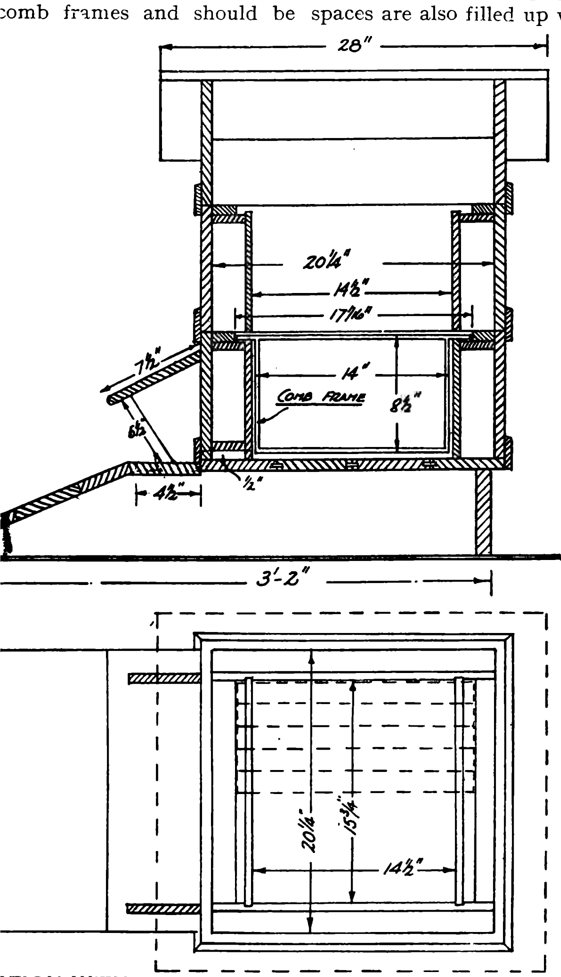
14½ ins. apart internal dimensions. The sides should be trenched out ¼ in. deep to receive the front and back, the trenches being stopped ½ in. from the top edges. The blocks filling up the space at front and rear (S) (Fig. 2) are ⅜ in. down from the top edge.

Additional blocks are screwed to these blocks spaced 17 1/16 in. apart to keep the comb frames positioned in the box with a ¼ in. space between inner walls and the ends of the frames. The side spaces are also filled up with blocks (T) as shown (**Fig. 2**).

The porch consists of four pieces: a back, two ends, and the roof. These are simply nailed or screwed together. The back has a short winter entrance cut away in it with two slotted holes above through which round-headed screws with washers under the heads are taken into the front of the brood chamber box. This allows the porch to be raised at any time thus exposing the longer summer entrance cut through the brood chamber front (Fig. 2). The porch is kept in a raised position by a hook and eye on each side.

British standard frames are shown in Fig. 3 and each section will take ten of these.

Normally these frames are easily obtained ready made so it is hardly worth while making them. Full particulars are given however in Fig. 3 should the reader have difficulty in obtaining them.



ATION WITH PLAN: ALSO COMB FRAME DETAILS

CUTTING LIST

	Long ft.	Long ins.	Wide ins.	Thick ins.
Floor Board—				
A 2 Battens .	3	2	6	1¼
1 Back . . .	1	8¼	6	1¼
1 Front . .	1	8¼	3	2
B 1 Floor . . .	1	10	22	⅞
C 1 Alighting board. . .	1	8¼	4½	⅞
D 1 Ditto . . .	1	8¼	15	⅞
E 2 Blocks . .	1	8	1½	⅞
Brood Chamber and Lift, for each—				
F 4 Sides . . .	1	10	9	⅞
G 4 Plinths . .	1	11¼	2½	⅝
Roof				
H 2 Front & back	1	10	9	⅞
J 2 Sides . .	1	10	5	⅞
K 1 Roof . . .	2	4	11	⅞
L 2 Ditto . . .	2	4	12	⅞
M 4 Plinths	1	11¼	2½	⅝
Porch—				
N 1 Back . . .	1	4	7¼	⅝
O 2 Ends . . .		7¼	6	⅝
P 1 Roof . . .	1	8¼	7½	⅝
Body Boxes, for each—				
Q 2 Sides . .	1	8¼	9	⅝
R 2 Front & back	1	4¼	8½	⅝
S 2 Blocks . .	1	3¾	2¼	⅝
T 2 Blocks . .	1	8¼	1⅝	⅝
U 2 Spacing blocks	1	3¾	1 3/16	¾

(272)

EVERYDAY TOOLS

(*Continued from page* 79)

The point is that a thin edge cuts more easily but is weaker. Thus, a bevelled-edge paring chisel can be sharpened at a lower angle than a firmer chisel. If you take 30 deg. as an average, however, you will not be far out. This is shown at **D**, Fig. 2.

How many men strop their chisels? It is not an unnecessary refinement; it can save a great deal of time. A finely stropped edge keeps its sharpness much longer than a coarse one, and it cuts better. In addition you can avoid rubbing on the oilstone by keeping a strop handy. The latter is just a piece of leather about 6 ins. by 3 ins. glued to a board and dressed with the finest emery powder and oil. A rub on this strop now and again enables the chisel to retain its edge so that it never becomes really dull. Maintain the same angle as the bevel and finish off by reversing it flat on the strop. (276)

Salvage.—Please put out your weekly bundle of waste paper for the collector. It is needed as urgently as ever. It is an actual munition of war and enters into the manufacture of war equipment of every kind.

What does "Strength" imply in Timber?

When we speak of a certain timber being *strong*, what exactly do we mean? Strong in what way? The word conveys little unless we have in mind some particular quality of strength required for a specific purpose. In these notes an attempt is made to explain the various mechanical properties in wood which have combined to render it indispensable in so many different ways.

ALL through the centuries man has been gradually learning the strange secret of *strength* in different woods. At first he had to rely solely on experiment. To-day he is guided by experience and scientific research. When we marvel at the durability of historic roofs which have survived for hundreds of years we are apt to think that the craftsmen of old knew better than we do now. Certainly they knew well—and all glory to them. But we are apt to forget that, without definite scientific data, they built for safety, using thicknesses far in excess of what was structurally necessary. What research and tests have proved is that timber, now too precious to waste, can be used more economically without any loss of strength.

Of course much we learn by mere instinct. A three-foot length of 3 by 3 stuff (used as a beam) as A, Fig. 1, may be amply strong, but common sense dictates that 6 by 3, as B, must be twice as strong. Experience, too, teaches that if a beam 6 by 3 is placed upright, as at C, it will be twice the strength of B and thus four times that of A. Again, whilst a timber like oak is the first choice for certain parts of a structure, it may be inferior to ash for other parts. A heavy cart wheel will have a nave of elm, felloes of ash and spokes of oak. All three timbers have great strength, but each in a different way, and each is employed according to the particular strain to which it is subjected.

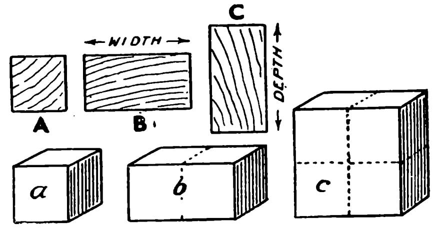


Fig. 1.—A beam (A) has half the strength of B. C, however (placed upright), has twice the strength of B, and four times that of A. The diagrams below (*a*, *b*, *c*) explain this: strength is proportional to the square of the depth.

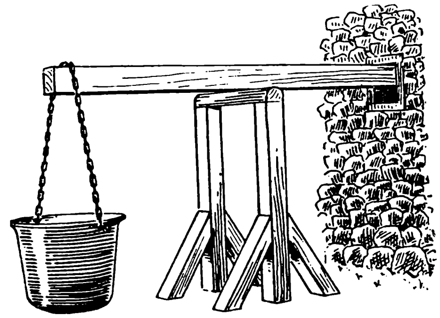


Fig. 2.—An early way of testing the strength of a beam. The bucket was filled with sand until the timber fractured.

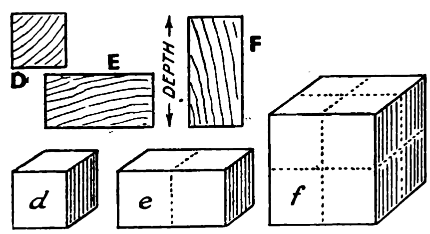


Fig. 3.—Stiffness in timber is an important property. E has only twice the stiffness of D, but F is *eight* times as stiff. Compare with Fig. 1 and see text.

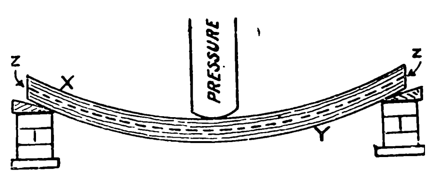


Fig. 4.—Bending timber. Note that, whilst the concave face (x) is in compression, the convex face is in extreme tension. The stress is thus along the dotted middle line (Z). The curve of the beam is purposely exaggerated.

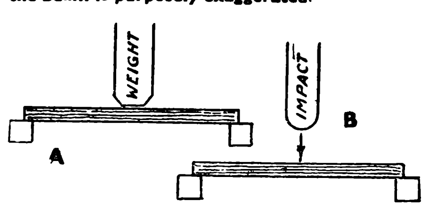


Fig. 5.—Showing what are termed the "static" (A) and the "impact" (B) methods of testing for bending.

MECHANICAL PROPERTIES: What are They?

One of the supreme qualities of wood is that it possesses mechanical properties which provide strength in different ways. Here we can deal only with faultless wood. The strength of a tree may be affected by its locality, by its manner of growth, and by defects (knots, etc.) which reduce its value. We know, too, that the limbs of certain trees (such as the ash) are less elastic than the main stem. Taking a perfectly sound tree, however, we look to its timber for properties which, variously, may be termed hardness, toughness, elasticity, durability, and so on.

Hardness and toughness are terms in common use. A so-called *hardwood* is not necessarily hard any more than a *softwood* is invariably soft. Larch is harder than many hardwoods. By hard we mean that neither on end grain nor surface is the wood readily dented. Thus for the leg of a table, chair, or stool we do not use a timber the surface of which might be bruised by the slightest impact. A hard surface resistant to impact is a property due directly to the particular growth of the tree.

Toughness is slightly different. A wood not easily bruised may still be one which yields under bending stress. By toughness we mean a quality which resists such stresses—a wood difficult to split, hard to tear apart, and which will bend to a considerable extent without breaking. This we could test on a sapling ash. Again, it is a case of growth associated with a certain tree, the fibres intertwined in such a way that they offer stubborn resistance to direct strain. On the other hand, if a tough wood is perfectly straight in grain, it is almost as readily split as timber which is coarse and brittle.

WAYS IN WHICH TIMBER RESISTS

Resistance.—The supreme quality of strength in timber may be summed up in the word *Resistance*. Our forefathers in distant centuries had a crude method of testing beams (Fig. 2). Held firmly at one end in a horizontal position, a bucket was suspended from the far end, and sand poured into this until the beam showed signs of fracture. The sand was weighed, and in this way the bearing capacity of a beam roughly determined. Comparisons with different timbers in varying sizes led to the adoption of certain woods for different purposes. Hence the old choice of oak or elm for column and beam. Builders of to-day take their dimensions at a glance from scientifically prepared tables.

What steady strain can a timber resist? Take the case of a horizontal beam supported firmly at each end and carrying a heavy load. Its strength must be proportionate to its depth. Reverting to Fig. 1, if two beams (A and B) are equal in length and depth, but one (B) is twice the width of the other, it will obviously be twice as strong. The diagrams below (*a* and *b*) make this clear. The accepted rough-and-ready rule is that resistance is proportional to the *square* of the depth. Thus if A is 3 by 3 the square is 9. B, being twice 3 by 3, is double the strength of A. In the case of the upright beam (C), however, the depth here is 6, and thus the square is 36 (see *c*)—that is, twice the strength of B and four times that of A. Remember, however, that if the beam is twice as *long* the rule works inversely; the longer one will have only half the strength of the shorter one. This is fairly obvious; a thin stick about 24 ins. long we could break across our knee, but if only 12 ins. it might easily resist our efforts.

Stiffness and Elasticity are closely related to resistance, but there is this difference. The deeper a beam is (that is, in height) its resistance to bending is greater than the resistance to direct load. Turn to Fig. 3, where the sections D, E, F are the same as those in Fig. 1 (A, B, C). E will be twice as stiff as D because its width has been doubled. In the case of F, however, it is the *depth* that has been doubled; and, whilst strength is proportional to the *square* of the depth, stiffness is proportional to the *cube*. Thus in Fig. 3, *f* has four times the stiffness of *e* and eight times that of *d*. Inversely, stiffness is proportional to the cube of the span, a beam twice as long as another being only one-eighth as stiff. In joists which carry plaster ceilings the quality of stiffness is of even more importance than strength.

Stiffness, being constant, is measurable only within the limit of elasticity. This elasticity (or resilience) is the power which timber possesses of returning to its original shape when released from any stress. Some woods when bent and released will immediately spring back to their former straightness. Greenheart is one of the most notable examples and for trout and salmon fishing rods has for long been the chosen timber. The recognised elasticity of yew dates back many centuries, whilst the qualities of hickory and ash for sports goods are common knowledge. Other woods may be readily bent, but owing to their lack of spring do not fully recover their original form.

Bending.—To resistance and elasticity the capacity to bend is closely allied, and in this department of research tests have provided us with valuable data. Whilst one timber may fracture under slight pressure another will bend without loss of strength. The power of resistance will be understood from Fig. 4. When a beam is subjected to bending pressure it is obvious that the concave face (X) is in compression whilst the convex face (Y) is in tension. Thus what may be called the "shear" (or splitting) stress is along the middle or neutral line (Z). In laboratories it is customary to apply two tests, the "static" and the "impact" (Fig. 5); that is, the beam (A) subjected to steady pressure which determines the point at which resistance yields; and (B) a transverse load applied suddenly. In this way the elasticity of the fibrous structure of different timbers is ascertained. Any old-time carpenter will instinctively arrive at approximately the same conclusions, this by experience and observation; and if we keep our eyes open we come to learn why yew for the bow, ash for cart shafts and felloes, and hickory for golf sticks and axe handles came into common use.

Cleavage, etc.—Several mechanical properties are concerned here. We may ignore the question of the resistance of timber to absolute *crushing*, as this rarely applies to everyday woodwork. The rigidity (or tensile strength) of timber *along the grain* is so great that one seldom meets with a case of force which would risk failure of tension. Where resistance to compression has to be considered is in the case of supporting timbers such as pit props and columns and posts which have to bear a heavy strain.

In the case of cleavage the ease with which timbers split is a matter of structure—a point which to-day is puzzling thousands who for the first time in their lives are engaged in chopping logs for firewood. Newly felled (green) wood, for example, splits more easily than seasoned logs, this because the moisture in it lessens the hold of one cell to another. Softwoods, again, are readily split because of a clearer line of definition between the layers of springwood and summerwood, the axe cleaving in an almost vertical line. In many hardwoods, on the other hand, resistance is stubborn. This may be due to density and hardness, but just as often to the interlocking grain which means that the fibres have to be literally torn apart.

In cutting mortise and tenon joints the question of cleavage resistance is often important, the design of structural parts rendering these liable to split along the grain. In the matter of resistance to abrasion this has to be considered in the case of timbers for flooring and paving.

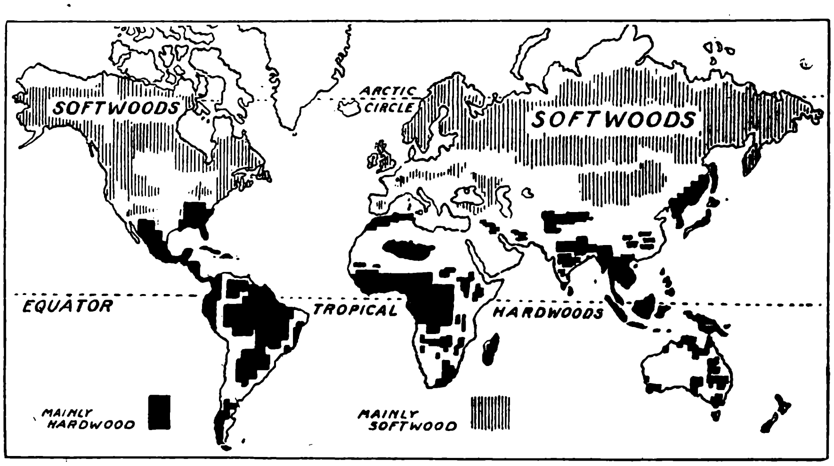
DURABLE TIMBERS

Durability in timber is something rather different from the specific properties named—some inherent quality that defies time rather than resists stress. Hardness is not essential, and a light easily-worked wood like western red cedar is known to be more durable even than oak. Oak, yew, elm, teak, jarrah, greenheart, sweet chestnut, larch and others are all durable timbers, due partly to the secretion of natural preservatives and partly to the chemical composition of the delicate cell walls. Yew, although rarely available now, takes perhaps the foremost place. For under-water work elm has been used for centuries, and the old wooden pumps—logs bored with a huge augur—were invariably made from this timber. Jarrah, for piers, bridges, paving blocks etc.; greenheart for canal lock gates and ship-building; teak for railway stock; oak for every class of structural work; larch for piles, wharfing and railway sleepers; beech for under-water work and steam-bending—all these have proved excellent substitutes. Many notable buildings, bridges and other structures which have stood the storms of generations and even centuries could be cited. (252)

THE WORLD'S TIMBER

We gave last month an article on the probable future supply of timber in the world. It has aroused interest amongst readers and we therefore give this map showing where the main sources of supply lie.

THE Timber Development Association has assured us that, after the War, there is to be *no shortage* of standing timber and *no lack* of production capacity. This sketch map roughly indicates our resources. We see first the great belt of softwood forests which occupies the Northern zones of both hemispheres. Again, in the temperate and tropical regions we see the wealth of standing hardwoods available. Over one-fifth of the globe's land surface is covered by timber forest, this amounting to between eleven and twelve million square miles. Practically unscathed by war this immense area is awaiting us. Saw and axe are ready, and when shipping is released from the grip of war the old supplies will reach us once more. The assurance that the timber is there will stimulate patience.



THE TWO CONTINENTS AND THE TIMBER THEY GROW

This map is a general guide to the disposition of timber, and it will be seen that the bulk of the hardwoods grow in the warmer districts. There are, however, hardwoods such as the oak, ash, beech, etc., in the moderate climates.

Making a Shed Door

The Ledged and Braced Type

Although somewhat crude in appearance this type of door is quite satisfactory for such structures as sheds, garden workshop, etc. It is usually made with tongued and grooved boards, the advantage being that if shrinkage occurs the tongues will conceal any gaps that would otherwise occur. Sometimes the braces are omitted but such a door is seldom really satisfactory because of the extreme liability to sag. Note that in every case the lower ends of the braces are at the hingeing side.

IN a door of this kind it is essential to order timber of a width that will suit the door size. For instance, the width of the tongued and grooved boards should be such that a convenient number can be arranged to complete the width. It is seldom that this can be worked out exactly and the usual plan is to take off an equal amount from the outside boards so that a balanced effect is produced. It is obvious, however, that it would not do to leave a mere narrow strip at each side. These would have little strength since there would be little to nail to and they would be liable to peel away. Remember in any case that the tongue on one side and the groove on the other will have to be planed away from the two outside boards.

One point to note when fitting is that the width should allow a generous gap because, since the door is liable to be exposed to the atmosphere, swelling may easily occur and this would cause the door to bind. Regarding the ledges these can be one of the patterns shown in Fig. 2. The first and third are more suitable for indoors, whilst the second would be better for outdoors since the drip groove prevents water from streaming down the surface of the door.

First Stages.—Having cut off all the boards to length, allowing about 1 in. full, reduce the width of the outer boards as required. Place one of the last-named on the bench and mark on it the position the ledges are to occupy. The top and bottom ones might stand in about 4 or 5 inches. The position of the middle one is obvious. The outer edge of this board must be planed perfectly straight. Nail on the three braces as shown in Fig. 2, using a large try square to ensure their being at right angles. It is stronger if the nails are allowed to go right through and project about $\frac{1}{2}$ in. after being punched in. They can then be clenched. The appearance is not very neat, however, and many will prefer to use shorter nails which do not pass right through. In this case, however, it is essential that they are dovetailed, that is sloped in alternate directions.

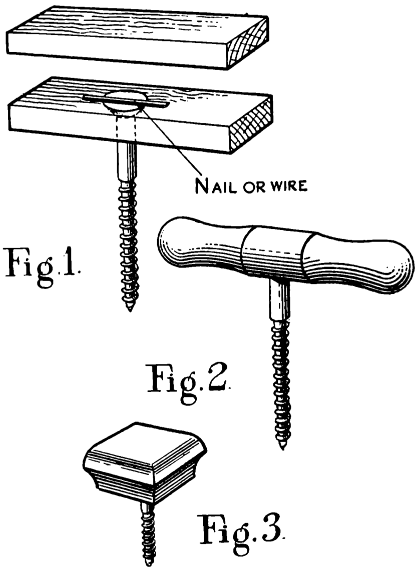
Reverse the work on the bench and lay the remaining boards in position. A cramp can be used to hold them together, but do not cramp too tightly because in the event of subsequent swelling the door may be distorted. Mark in a couple of pencil lines opposite each ledge as a guide for driving in the nails (see Fig. 3). The reason for nailing from this side is that it is stronger to nail through the thinner wood into the thick.

Braces.—It makes a neater job if these are chamfered at their edges to agree with the ledges. Fig. 4 shows how the length is ascertained. Lay a piece of the board with its edges already chamfered diagonally across the two ledges. With a rule adjust the position so that it stands in three ins. at both ends. This is made clear in Fig. 4. To mark the length place a square (or a square piece of thin wood will do) on the work as at B, Fig. 4. This enables a pencil to be drawn up exactly in line with the edge of the ledge, so giving the mark Y. It will be realised that direct marking is not possible owing to the chamfer on the ledge.

Since, however, the braces have to be cut into the ledges the length is greater by the extent of the chamfer. It is therefore necessary to make marks X opposite top line of the chamfer on the ledge. These details are shown clearly at A and B, Fig. 4. Join the marks X on both sides of the brace and cut off the wood, trimming it with the plane afterwards. The corners are taken off as given at C, Fig. 4, the exact angle being ascertained by marking across the bevel a line joining X and Y.

At the same time as the braces are marked out the notches in the ledges can be marked. It is the marks Y that are needed. Then place the brace with its corners cut off in position and mark point X as shown in Fig. 5. The wood can then be cut away. It is difficult to use the saw, but it can be cut in neatly with the chisel. Fix the braces with nails similarly to the ledges. Put in pencil lines as a guide for nailing.

Assuming that the door is to have an outside position and is to be painted, the inner surfaces of both ledges and braces should be given a coat of paint before fixing. (273)



HOW CORKSCREW IS MADE

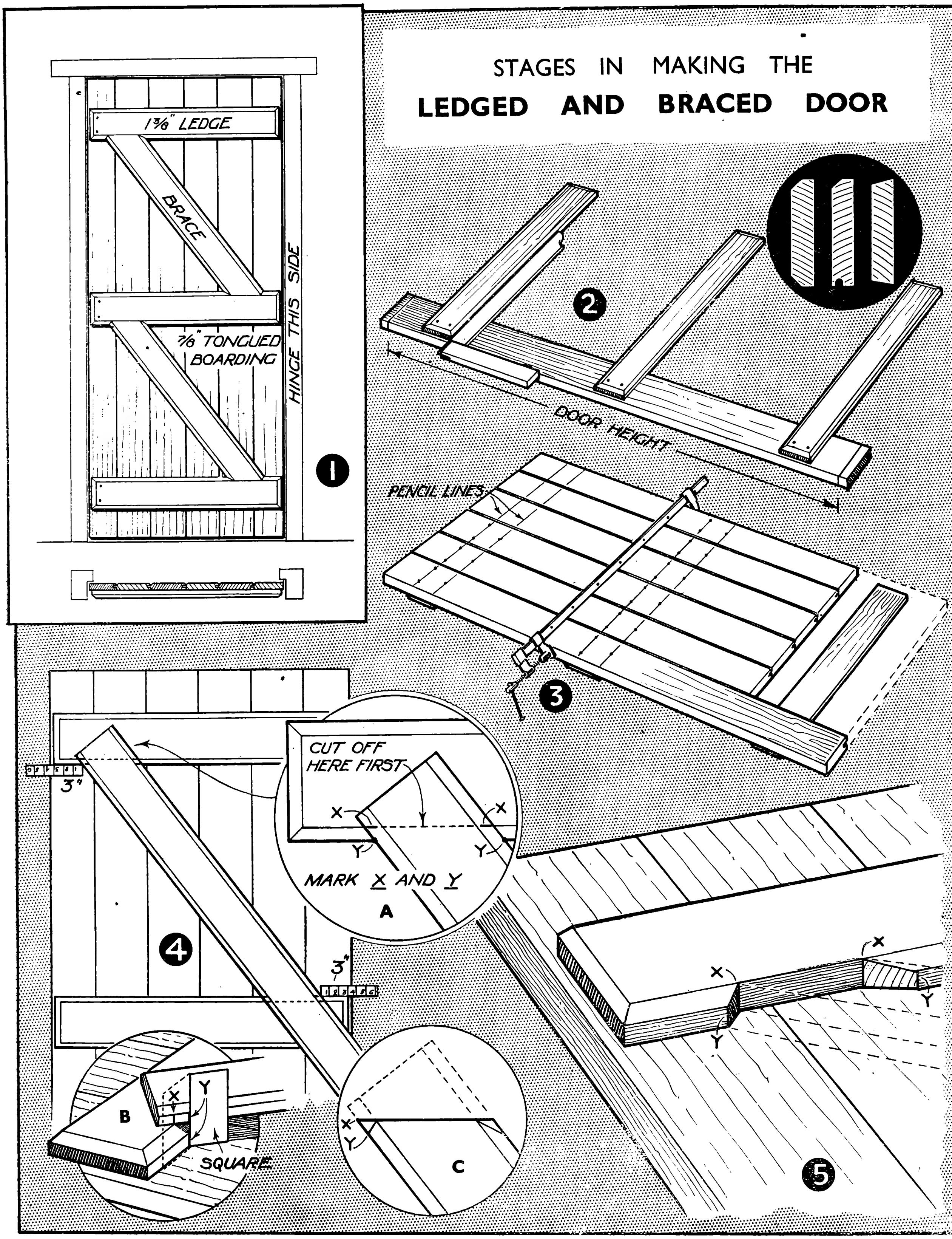
Making Your own Corkscrew

A READER from Scotland sends us a simple idea for making cork-screws which in these difficult times are not easily procurable. The idea may also be adapted in the making of knobs for cabinets or similar purposes. The only materials required for making the corkscrew are a strip of hardwood $5\frac{1}{2}$ ins. by $\frac{3}{4}$ in. by $\frac{5}{8}$ in., a $2\frac{1}{2}$ in. No. 10 or 12 countersunk head wood screw and a 1 in. wire nail, with the head removed, or a length of stiff wire which will just fit the slot in the screw.

Plane up one face of the strip of hardwood and cross cut in order to form two pieces, Fig. 1. Bore a hole for the shank of the screw and contersink for the head. Care should be taken to see that the countersinking will permit of the head lying flush with the surface of the wood. Place the screw in position and, using the slot in the screw as a guide, form an indentation with the edge of the screw-driver on either side of the screw, the indentations being of sufficient length to accommodate the nail or piece of wire. As with the head of the screw, the nail or wire should be flush with the surface of the wood. The two pieces can now be glued together and finally shaped as shown in Fig. 2 or any other desired shape.

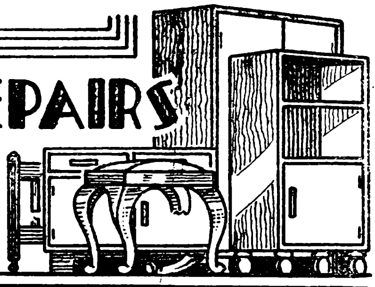
Fig. 3 shows a knob suitable for a cabinet or drawer front, formed in a similar manner to the corkscrew, but using a smaller screw and nail to fit the slot in the screw. (220)

Two kinds of gouges are made ; firmer and scribing. Firmer gouges are ground on the outside and are used for all general purposes such as scooping out depressions, etc. They are easily sharpened on the oilstone, a rocking movement being given. Scribing gouges are ground at the inside and are needed for vertical paring (they are used largely for scribing mouldings). They are sharpened with the oilstone slip. Keep them for fine work only because the sharpening is necessarily a lengthy process if the edge is in bad condition.



NOTE THAT THE DOOR IS HINGED AT THE SIDE WHERE THE BRACES ARE LOWEST

Old and new
FURNITURE REPAIRS



BROKEN LEGS AND FEET

Furniture, especially heavy pieces, should never be dragged over the floor, even though fitted with gliders or castors, for these are never virtually safeguards against sunken boards, large knot holes, projecting carpet nails, and so on. The sudden jar is apt to break something—the weakest thing, which is inevitably feet.

FIVE typical breakages are indicated by the arrows in Fig. 1. The same breakages may apply to many similar articles, so we shall confine ourselves to the five most common breaks and show the best way to deal with them.

Back Chair Legs.—Diagonal breaks invariably occur in the back legs of lightly-constructed chairs, as shown at A, Fig. 1. Such breaks are due to the short grain in the wood owing to the curved shape. If a fairly clean break it is only necessary to screw the parts together before gluing. The screws draw the pieces closer together than a bind of cord or the use of small fretwork cramps and they hold the parts firm.

Screw holes are bored in each piece as shown, and are countersunk so the screw heads will sit slightly below the surface. Having pressed the parts neatly together, a bradawl is used to make an inroad for the screw threads, following which the screws are driven home. When the join is ultimately glued and screwed, the screw heads are concealed with plastic wood or wax stopping.

By the way, never use *thin* screws for repairs, such as 1 in. by 4 flatheads. The heads of these " bury " themselves too easily in the wood. At the same time, avoid the use of very thick screws, for these mean unnecessarily large holes which are difficult to conceal. The best size is 1 in. by 6 (or 8).

If the break is splintered, or assuming the broken off piece is missing, a new piece will need to be fitted. In such a case the slanting locked splice is incorporated (B), the amount of slant being determined by the angle of the break. As pointed out in a previous article in this series, allowance must be made in the proportions of the new piece for fitting and cleaning-up purposes.

Compound Break.—This break (C, Fig. 2) is a double one and the only remedy is to fit on a new piece. Incidentally note how the fixing screws are arranged so that a long screw can be driven into a rail. Always endeavour to introduce this feature for, apart from making a stronger splicing job, the rail is made much firmer.

Have the splice shape vertical with the leg (see dotted lines). One half of the join should be as strong as the other half. Avoid acute " dovetailing " ends ; an angle of 60 degrees is the best. It is wise to try and match the new piece with the leg, but the grain of the new piece should not run so short as the original piece if it can be avoided.

A very common breakage is indicated at D, Fig. 2. It is generally caused by dragging the chair across the floor. The loose piece is glued back in position and pinned. If lost, a new piece is fitted, as shown. One may use a single screw and two small corrugated metal fasteners. If a glider has to be fixed on the leg, one of the three prongs will serve much in the same way as the fasteners, but it is advisable also to have the part screwed.

Front Chair Leg Repair.—A difficult thing to repair is a broken front chair leg (E, Fig. 3). A usual method employed is to dowel the parts together, but it takes patience and care to carry out successfully. Indeed, it is a method not to be recommended ; one can never get the broken-off portion joined neatly and satisfactorily to the leg. When the break is flat, as shown, there is a reasonable chance of effecting a neat repair.

To begin, one taps two panel pins into the foot near two opposite corners. Having removed the heads with nippers, the protruding shanks are filed to a

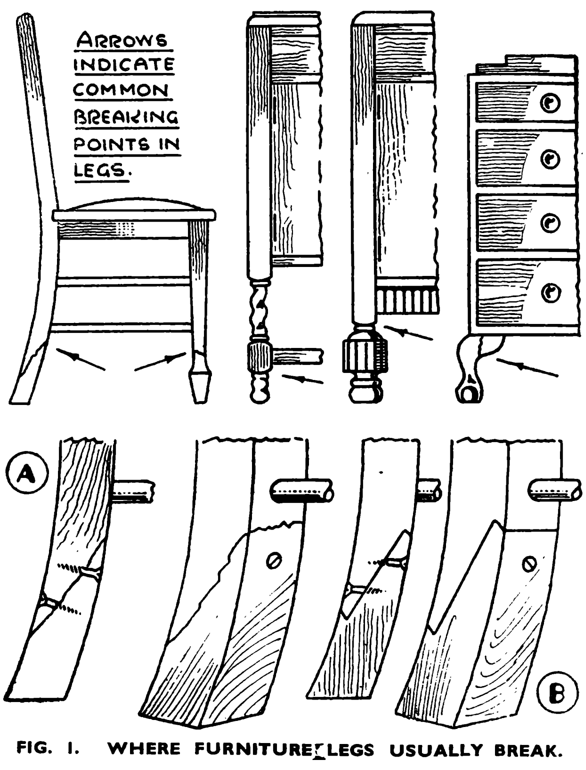


FIG. 1. WHERE FURNITURE LEGS USUALLY BREAK.

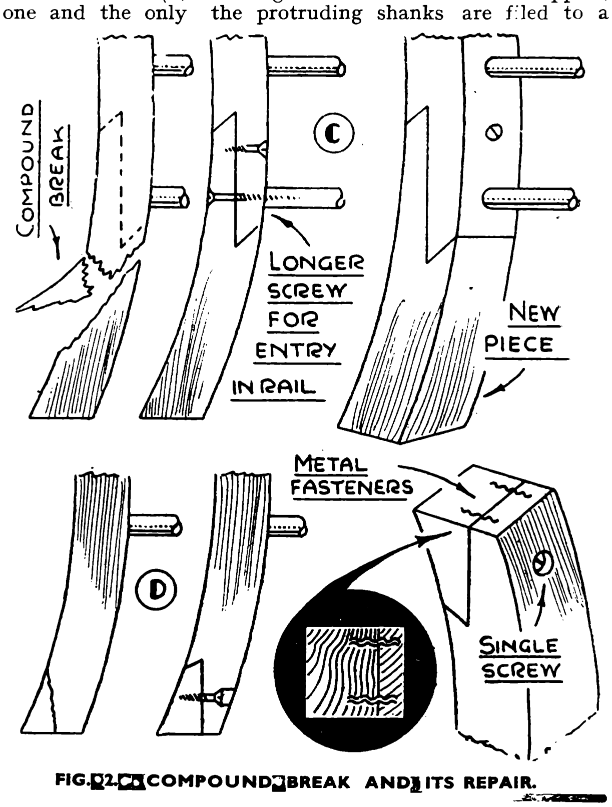


FIG. 2. COMPOUND BREAK AND ITS REPAIR.

HEAT WOODWORK BEFORE GLUING

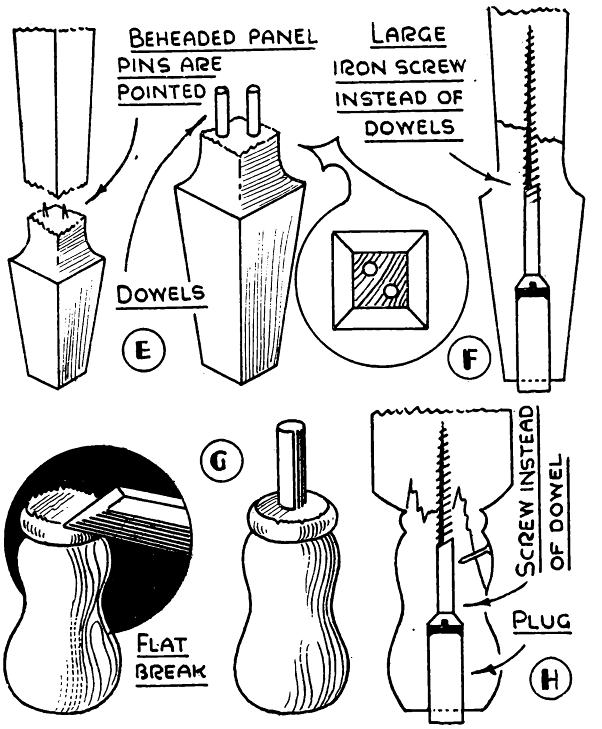


FIG. 3. MENDING SQUARE AND TURNED FEET.

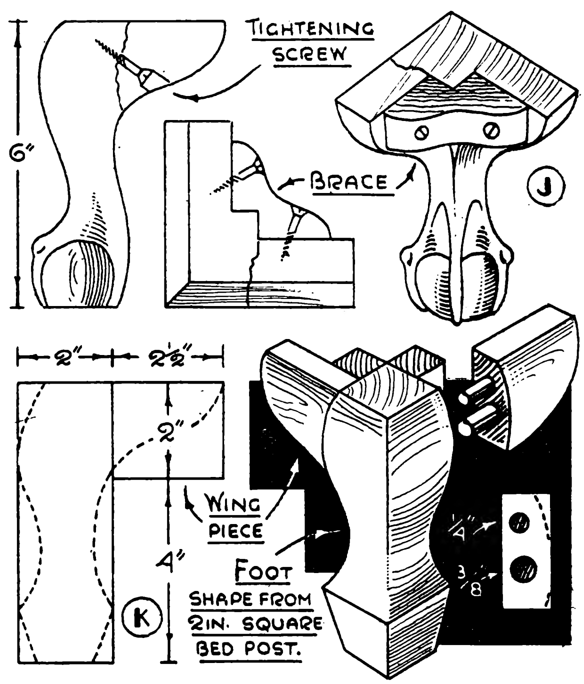


FIG. 4. TREATMENT OF CABRIOLE LEGS.

point. The points of the pins should not project more than ⅛ in.

One then carefully pushes the foot against the leg so the points make a fairly accurate indentation in the leg. The pins are then withdrawn and the tiny holes enlarged with a fine bradawl, after which the dowel holes are bored with a ¼ in. bit. When the dowels are glued in the foot and glued to the leg, a few taps with a mallet usually suffices in knocking the foot home, but the use of a cramp will make a neater joint.

If the break is a long, slanting one, of course, it only requires to be glued and nailed (or screwed) together. But, when flat and situated high up from the foot, dowelling is essential. When low down, the writer finds it easier and more convenient to bore a hole right through the foot for a single large screw (see F, Fig. 3). The screw not only ensures a stronger repair ; it also draws the foot tightly against the leg.

When making the screw hole, drill to a depth of 1 in. or so with a ⅜ in. dowel bit, then continue the hole right through with a drill, or shell bit, suiting the thickness of the iron screw to be used. The foot is then held in position on the leg so the leg end can be partly drilled. Remove the foot, continue the drilling (with a finer bit) in the leg to suit the length of the screw. Screw the foot to the leg as a test for trueness, then finally glue and screw. The ⅜ in. hole in the foot is plugged with a piece of dowelling.

Turned Feet.—The feet on most turned legs are often easily broken off where weakened by a bead. Such breakages are, fortunately, flat (see G, Fig. 3). It is only a matter of levelling the surface of both foot and leg and fixing the former to the latter by means of a single dowel of suitable diameter, ½ in. being adequate for most requirements.

In some cases, however, the break is not flat, such as shown at H, Fig. 3. Here, again, the single screw comes to the rescue. Note, too, the use of a panel pin to keep the " shaver " of wood correctly in place. Alternatively, the repair could be bound with cord (after gluing) until the glue sets, thereby avoiding the chance of splitting the wood.

Ball-and-Claw Feet.—It is usually the " wings " on ball-and-claw, cabriole feet, etc., that suffer when the feet are given a hard knock. That is the chief reason why such feet should not be fixed beneath a carcase by the wings, for these are purely *ornamental* in many cases. They are not intended for fixing purposes. The best way to fix broken wings is detailed at J, Fig. 4. Simply cut out a shaped brace from ⅞ in. wood and glue and screw behind the foot. This is in addition to screwing through the wing into the foot.

It may happen that both front ball-and-claw feet are badly broken—so badly in fact that new feet are necessary. If you cannot purchase new feet, or make copies with the aid of carving tools, and if the piece of furniture happens to be an " odd " item, you can get out of the difficulty by making the style of foot shown at K, **Fig. 4.**

All that is required is a 12 in. length of 2 in. square bed-post and four 2½ in.long, by 2 in. wide by 1 in. thick " wing " pieces. The wing pieces are dowelled flush with the top and outside face of the 6 in. long posts (assuming you are making 6 in. long feet).

On account of the shaping, the wings should be connected with a ¼ in. and ⅜ in. dowel pin (see end view), keeping the thinner dowel at the top, for it is here that most of the waste wood is removed.

Having joined the wings to the posts satisfactorily, pencil the outside shape on the work, as indicated by the dotted lines. Remove the wings, and, clamping the post upright in the bench vice, cut it to shape with a bow-saw. Trim it roughly with gouge and wood rasp, and pencil on the same shape at the other side. Cut as before, and glue the wings to the work and allow to set before shaping them.

It is better to shape the wings whilst glued on the feet you can get at them better, and besides, it may be necessary to apply cramp pressure to the wings to press them home—a difficult thing to do properly if the wings are cut to shape.

(271)

FLOOR STANDARDS

(*See page* 76)

TYPE " A "	Long ft.	Long ins.	Wide ins.	Thick ins.
Shaft. 2 pieces	4	4¾	1½	3
Base. 1 piece	1	1	13	3
1 piece	0	4	4	3
Skirting. 8 pieces		5⅜	1¾	1
Neck Moulding. 4 pieces	0	2	⅜	⅜
Blocks. 16 pieces	0	1¾	¾	¾
Type " B "				
Shaft. 2 pieces	4	8¾	2⅛	⅞
Base. 1 piece	1	1⅞	12	1¾

(268)

?——The Question Box——?

In these columns we endeavour to help readers in practical difficulties.

REGULATIONS

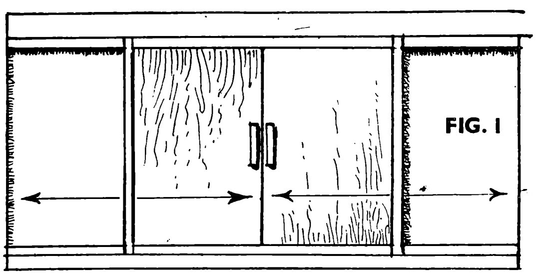
Each query must be accompanied by a stamped addressed envelope.
A coupon from page iv of cover must be enclosed.
Full particulars must be stated, and, if possible, a rough sketch sent.
Only problems connected with woodwork can be dealt with.
Special designs for individual requirements cannot be prepared.

Queries should be addressed to: The Editor, WOODWORKER, Montague House, Russell Square, London, W.C.1.

SERVICE HATCH **H.L.B. (Bristol). I wish to make a service hatch from kitchen to dining-room, and would welcome assistance regarding the best way to set about it.**

Reply.—Your letter provides no particulars of the wall in which it is desired to construct the service hatch; we assume therefore that it is a good brick wall or possibly one built of breeze blocks. A convenient height for the opening is 3 ft. 6 ins. from floor to sill, whilst the size of the opening itself may be about 15 ins. high by 20 ins. wide to 18 ins. high to 24 ins. wide. In chopping out the opening every care should be taken not to damage the wall in other respects. With the hole square and clean the upper brickwork can be carried by a 3 ins. header of wood. The sill covered with $1\frac{1}{2}$ ins. wood and the sides with 1 in. stuff. If the wall is old and not in best condition it may be desirable to frame the opening with thicker wood at sides and sill as in Fig. 3.

In making the sill allow sufficient width to take the dish or tray safely so that there may be no danger of overbalancing. A stout ledge is sometimes used or a flap with bracket support. Another good result is obtained by fitting a bottom hinged door to the hatch so that when let down it provides good space for resting the service. Sliding doors appear to receive general favour and for a 24 ins. by 18 ins. size the design might be worked out with two doors to travel in grooves or on runners as in Fig. 1. Each door passes behind a thin neat length of vertical fillet which serves as a stop when opening the hatch. One length only of track is thus necessary, but should space sufficient for this not be available for this arrangement a single door can be used on the lines of Fig. 2. (235)



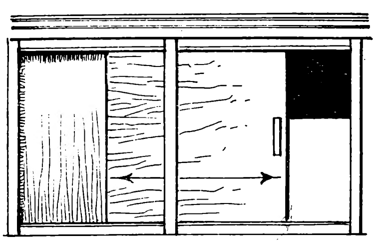


FIG. 2

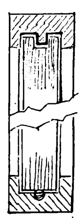
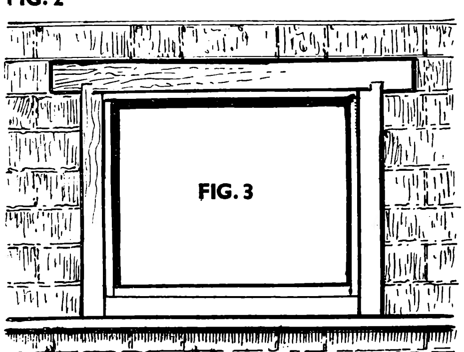


FIG. 4



SERVICE HATCH. ALTERNATIVE DESIGNS

Note for Overseas Readers.—The fact that goods made of raw materials in short supply owing to war conditions are adver-

(Continued in next col.)

WHY "FORE" PLANE? **G. R. (Wandsworth) asks why the plane of 18 ins. or so in length is known as the "fore" plane.**

Reply.—This plane dates back many years, and is so called because it is used *before* the jointing or smoothing plane. Here is what an old writer of the late 17th century says about it:

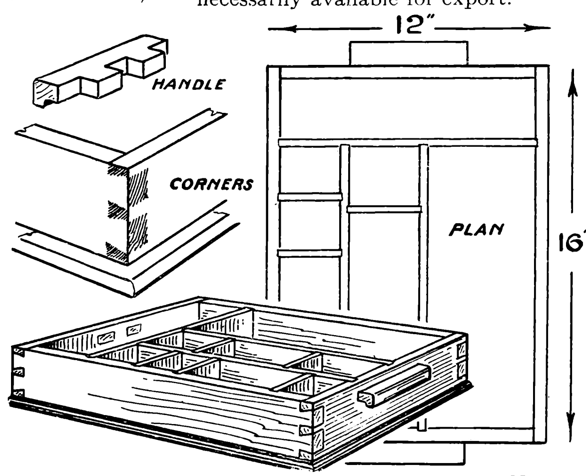
"*Fore Plain,*" *so called* "*because it is used before you come to work either with the smooth plain or with the joynter. The edge of its iron is not ground upon the straight as the smooth plain or the joynter are, but rises with a convex arch.*" The writer goes on to say that its office is to prepare stuff for work with other "plains." It is "set ranker" than others. What this boils down to is that it was the early form of jack plane. (274)

BOX FOR HOUSEHOLD TOOLS **J.D.M. (Dundee) sends the plan of a box used for holding household tools which he has seen, and asks for some guidance as to construction.**

Reply.—Before deciding on the overall size, measure your tools so that items like hammer, screwdriver, etc., can be conveniently housed. If (as you say) you can lay your hands on oak, nothing could be better. Sides must not be less than $\frac{1}{2}$ in. thick and may be a shade more if you prefer. Dovetail the corners. Partition pieces may be $\frac{3}{8}$ in. (or $\frac{1}{4}$ in. for the shorter ones), all housed in. Height of sides (excluding bottom) varies from $2\frac{1}{4}$ ins. to 3 ins.; this is a matter you must judge for yourself. The bottom, with a slight overlap, may be jointed to width from $\frac{3}{8}$ in. stuff, screwed to sides and ends and either screwed or nailed to partitions. Wooden handles, 5 ins. long, can be worked from $\frac{7}{8}$ in. or $1\frac{1}{8}$ in. stuff, tenoned to ends and screwed from the inside. You will understand that, not having a list of your tools, the plan indicated is only a suggestion. (275)

(Continued from previous column)

tised in this magazine should not be taken as in indication that they are necessarily available for export.



CONSTRUCTION OF HOUSEHOLD TOOL BOX

SALE AND EXCHANGE (1½d. per word)

Over 1,000 Formulas for the handyman, woodworker, metalworker and others in our new book. Price 3/3, postage paid.—W. O. ASHDOWN, 164, Woodward Road, Dagenham.

Mark Your Tools.—Apology. Messrs. EYRE & BAXTER, 55, Brown Street, Sheffield, regret delay in executing orders for name stamps owing to pressure of Government contracts. Future orders will take at least 13 weeks to execute.

Inlay Bandings.—Lines and Strings in various sizes and patterns. —Below.

Veneers are essential to perfect modern designs. Any quality veneer supplied. Stamp for list.—J. C. LIPPIATT, 2, Avenue Rd., Brentford.

French Polishing.—Thoroughly practical tuition by post in all processes. See our list of pupils placed in well-paid positions.—BAKES, 15, Jesmond Avenue, Bradford.

Wanted.—Driver 24-in. Scroll Saw; 4-in. Planer, Jointer, Rebater; 10-in. Bandsaw; Zyto Treadle Bench with all accessories.—R.A.Y., 44, Sandy Way, Walton-on-Thames, Surrey.

Wood Pullalong Toys.—Easily made from scrap wood. Complete set of 12 patterns and instructions, 5/6 post paid. Include Dog, Duck, Elephant, Emu, Horse, Gazelle, etc.—FUDGE (W.), 72, Parry's Lane, Bristol 9.

Handicraft Teaching.—Craftsmen, Wood or Metal, prepared for examinations by correspondence coaching. Special terms for men in the fighting services. Government grant available.—MARRIOTT'S, 10c, Grange Road, Chester.

Upholsterer's Materials.—We can only supply our regular customers until further notice.—HARBETT'S WHOLESALE WAREHOUSE, 98, Falkland Road, London, N.8.

Toy Wheels.—(Wood), 3 ins. to 6 ins. diam. only. S.A.E. brings price list and particulars.—GREER, 931, Argyle Street, Glasgow, C.3.

Wanted.—" Woodworker " Series. " Cabinet Construction " and " Woodwork Tools."—TOMLINSON, 1, Ovington Grove, Fenham, Newcastle-on-Tyne

Wanted by Private Craftsman.—Woodturning Lathe similar Delta, " Driver," Ward, Tauco. High price for perfect machine. Fullest details; price.—BM/XBX, London, W.C.1.

Scenic Railway Modelling.—A lot of the fun of operating a miniature railway is building a realistic setting around it. The popular "OO" scale of 4mm. to the foot permits of quite an extensive layout in limited space. For those entering the ranks of Model Railway operators, and those already actively engaged, a Planbook has been written by an enthusiastic and expert builder and operator. Price 5/6, by post 5/9.—Below.

Railway Plans.—" Lineside " Plans for "OO" Railways give necessary instructions for the construction of complete range of Architect and Eng. features drawn to conform to B.M.R.S.B. with mod. for " Dublo," " Trix," etc.—Below.

Miniature Aircraft.—In the " Planbook," " Making Miniature Aircraft," Mr. R. H. Warring reveals secrets of art of making models which will bear the closest scrutiny and look " real " to the eye of the camera. Nearly sixty illustrations included with plans for three representative modern aircraft. Price 4/6, by post 4/8. Also " Making Identification Models," Price 1/6, by post 1/8.—Below.

Galleons.—A handsome " Planbook," " Building a Galleon," embraces full instructions for making models of many of these grand old ships. Profusely illustrated. Contains set of eight progress-plans, size 20 ins. by 30 ins. Price 12/6, by post 13/-.—Below.

Yacht.—How to build a fast-sailing racing model by new and rapid method at cost of only a few shillings. Fully illustrated; full description, working drawings, scale plans and licence to build. Price 3/6, by post 3/8.—Below.

Oil Engine.—Perfect working model which runs on air can be made of simple materials to be found in every home. New model-making technique is fully illustrated and described. Price 2/-, by post 2/2.—Below.

Airplanes, Ships, War Weapons and " OO " Railways.—Send 3d. and unstamped addressed envelope for particulars of above " Planbooks," and new list of over 100 Plans.—MODELCRAFT, LTD., 77 (W.W.), Grosvenor Road, London, S.W.1.

Balsa.—1 in. square by 18 in., ¼ in. square by 15 in., 2 pieces each; 7-16 in. square by 12 in., one piece. Also few small pieces and cuttings. **Rubber Strip.**—8 yds. by ¼ in. flat, 8 ft. by ⅛ in. flat., unused. **Landing Wheels.**—1 pair 1½ in. diameter, celluloid. **Carving Tools.**—50 assorted. Offers wanted for all or part of above. **Anvil.**—28 lbs., 14½ in. overall, 25s. plus carriage. **Solid Kit.**—Complete super model, ¼ in. to 1 ft., Lockheed P.38. 9s. plus postage.—J. D. HEALEY, AT/2, Shaftoe Leazes, Hexham, Northumberland.

Lindsey County Council—Education Committee

A WOODWORK MASTER is required at Skegness Senior Council School. Certificated Teachers will be paid in accordance with the Burnham Scale II, plus war bonus of £52 per annum. Craftsmen will be considered for appointment, salary to be based on qualifications and experience.

Application forms can be obtained from the undersigned.

F. J. BIRKBECK, Director of Education.
County Offices, Lincoln.

LET ME BE YOUR FATHER

You need help and fatherly advice in difficult times like these. I am in the position to give that to you FREE.

We teach nearly all the Trades and Professions by Post in all parts of the world. Distance makes no difference. The most progressive and most successful Correspondence College in the world.

If you know what you want to study, write for prospectus. If you are undecided, write for my fatherly advice, it is Free.

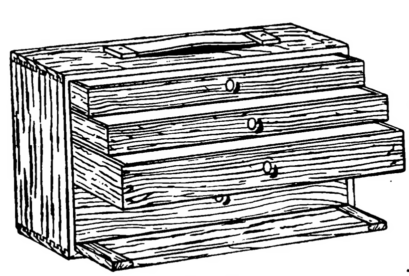
DO ANY OF THESE SUBJECTS INTEREST YOU ?

Accountancy Examinations
Advertising&Sales Management
Agriculture
A.M.I. Fire E. Examinations
Applied Mechanics
Army Certificates
Auctioneers and Estate Agents
Aviation Engineering
Aviation Wireless
Banking
Blue Prints
Boilers
Book-keeping, Accountancy, and Modern Business Methods
B.Sc (Eng.)
Builders' Quantities
Building, Architecture, and Clerks of Works
Cambridge Senior School Certificate
Civil Engineering
Civil Service
All Commercial Subjects
Commercial Art
Common Prelim. E.J.E.B.
Concrete and Structural Engineering
Draughtsmanship, all Branches
Engineering, all Branches, Subjects and Examinations
General Education
G.P.O. Eng. Dept.
Heating and Ventilating
Industrial Chemistry
Institute of Housing
Insurance
Journalism
Languages
Mathematics
Matriculation
Metallurgy
Mining, All Subjects
Mining, Electrical Engineering
Motor Engineering
Motor Trade
Municipal and County Engineers
Naval Architecture
Novel Writing
Pattern Making
Play Writing
Police, Special Course
Preceptors, College of
Press Tool Work
Production Engineering
Pumps and Pumping Machinery
Radio Communication
Radio Service Engineering
R.A.F. Special Courses
Road Making and Maintenance
Salesmanship, I.S.M.A.
Sanitation
School Attendance Officer
Secretarial Examinations
Sheet Metal Work
Shipbuilding
Shorthand (Pitman's)
Short Story Writing
Speaking in Public
Structural Engineering
Surveying
Teachers of Handicrafts
Telephony and Telegraphy
Television
Transport Inst. Examinations
Viewers, Gauges, Inspectors
Weights and Measures Inspectors
Welding
Wireless Telegraphy and Telephony
Works Managers

If you do not see your own requirements above, write to us on any subject. Full particulars free.

Dept. 56, THE BENNETT COLLEGE SHEFFIELD, ENGLAND

Machined Ready to Assemble Engineer's Tool Chest



No. 27

No. 27. Size 15in. x 9¼in. x 8in., with 4 drawers as shown, all fittings included.
IN OAK **32/6**

Finished and Polished ready for use, **52/6**

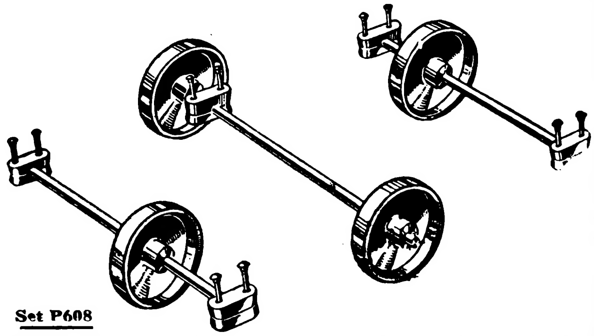
No. 30. Size 17in. x 12¼in. x 8in, with 5 large drawers, all fittings included.
IN OAK **37/6**

Finished and Polished, ready for use, **57/6**

Carriage Paid.

CHAS. F. OSBORN
THE GLEBE SAW MILLS, GLEBE ROAD, DALSTON, LONDON, E.8. Telephone: Clissold 4184.

COMPLETE SETS OR SEPARATE PARTS FOR TROLLEYS, TRUCKS, BARROWS, ETC.



Set P608

COMPLETE SETS FOR TROLLEYS, WAGONS, SACK AND WAREHOUSE APPLIANCES—ALL READY TO FIX. PLAIN OR RUBBER. AXLES ANY LENGTH. ASK FOR SET P.608. WHEELS ANY SIZE TO ORDER. ASK FOR IRON WHEELS LIST PLAIN OR RUBBER TYRED.

COMPLETE SET OF HAND-TRUCK UNDERWORKS

"The Little Wonder" Set Truckwork Complete, ready to fix, no trouble at all. **Set No. O**—Wood wheels up to 30 in. diam. Steel Tyres, Axle, Springs, Scrolls, etc. **Carry 1½ cwt.**

£4-19-6

Also other Complete Sets with Rubber-Tyred Wheels. No special knowledge required for fitting. Also Wood Wheels up to 12 cwt. load.

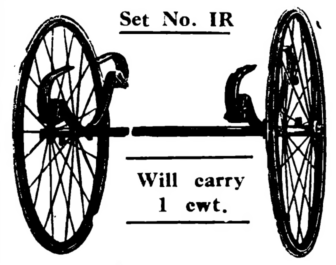
Ask for Truck and Wheel List.

We are noted for Castors of all kinds, Trolley Wheels, etc., Iron Steel and Rubber. Wheels in Brass, Iron, Steel. Ask for Castor list.

Supplies are mostly restricted by Government. All prices subject to variation without notice. Close early Saturdays.

Send 2d. stamp for LISTS to Dept. "W." *Tel.* RODNEY 3011

Set No. IR



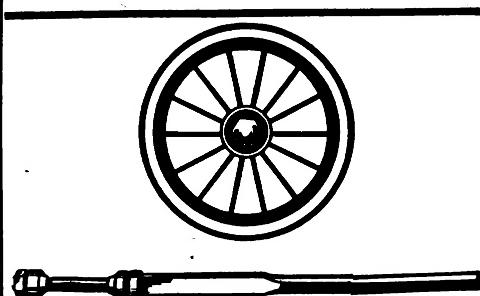
Will carry 1 cwt.

Stout Wheels, Thick Spokes Rubber Tyres, wired on. Best Steel Springs, Scrolls, etc. Strong ¾in. Axle. Any length to order.

9 Sizes of Wheels. 5 Sizes of Rubber. Wheels and Axle sold separately.

Also made for 4 cwt. load.

Ask for Truck List.



Our Grand Extra Strong RUBBER-TYRED WHEEL 4R

Supplied in 9 sizes, with Axle and Caps.
4 Sizes of Rubber, loads 3-4 cwt.

No. 4R Axles any length to order.
Always ask for S.L.W.W. No. 4R Wheels.

Plain or Ball-Bearings.

Complete sets supplied for making Hand Trucks.
With Wheels, Axles, Caps, Springs, Scrolls, Clips. Ready to fix. Also supplied in many sizes to carry 1 cwt. load.

SPECIALISTS IN WOOD WHEELS, HAND-TRUCKS, BARROWS, TRADE TRUCKS, BANK & WAREHOUSE TROLLEYS: CASTORS ALL KINDS TROLLEY WHEELS AND FITTINGS—EVERY SIZE & TYPE.

No Toy Wheels Available at Present.

Ask for Trolley List.

THE SOUTH LONDON WHEEL & RUBBER TYRE WORKS LTD.

54 NEW KENT RD., ELEPHANT & CASTLE, LONDON S.E.1
(Established 1860)

TYZACK'S ELEPHANT BRAND

SAWS

CRAFTSMAN MADE AND FULLY WARRANTED

•

OUR BOOKLET "SERVICING YOUR SAWS" TELLS YOU HOW TO GET THE BEST RESULTS

•

FREE ON REQUEST

enclosing this advertisement to

W. TYZACK, SONS & TURNER, LTD.

LITTLE LONDON WORKS SHEFFIELD 8

ICS

Postal Training for Success in WOODWORKING

In woodworking as in all other trades the good jobs go to the *trained* men, to those who have *studied* in their *spare time*. There is no more systematic and authoritative instruction in all branches of Woodworking than that offered by the I.C.S.

Employers everywhere accept the I.C.S. Diploma as a proof of superior knowledge and skill. It is a money-bringing asset.

Inform yourself just how the I.C.S. can increase your money-earning power in any of the following subjects—

Carpentry	**Carriage Building**
Joinery	**Woodworking Drawing**
Staircase Work	**Machine Woodworking**
Furniture Making	**Saw Mill Management**

We give special and successful preparation for City and Guilds and 1st and 2nd Handicraft Examinations.

Special terms for members of H.M. Forces.

.... **USE THIS COUPON** ....

Dept. 22, International Correspondence Schools Ltd.,

INTERNATIONAL BUILDINGS, KINGSWAY, LONDON, W.C.2.

(Use PENNY Stamp on UNSEALED Envelope)

Please send me particulars of your Courses in WOODWORKING. I assume no obligation.

Name .... Age ....

Address ....

....

53 YEARS OF SERVICE

THE WOODWORKER MAY, 1944 COUPON

Published by the Proprietors, EVANS BROTHERS, LTD., at Montague House, Russell Square, London, W.C.1.
War-time Address: 44-46, Clarence Road, St. Albans, Herts. Telephone: St. Albans 1231.
Agents for South Africa, Central News Agency Ltd
Printed in Great Britain by GIBBS & BAMFORTH LTD., St. Albans, Herts.